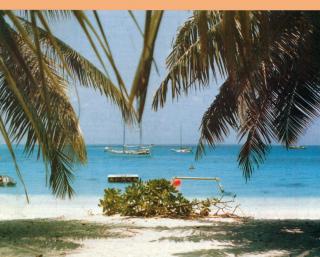
Amateur Radio



JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

VOL 54, No 10, OCTOBER 1986

Construct a DIRECT CONVERSION RECEIVER for 80m 1986 REMEMBRANCE DAY ADDRESS ANTENNA ARRAYS Conclusion AMATEUR RADIO ENGINEERING PROJECT Part 2 DESIGN of a BAND-PASS FILTER for 2m SMALL SIGNAL BLT AMPLIFIERS



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Looking from Direction Island to West Island across the lagoon on Cocos (Keeling) Islands. Photograph courtesy Neil Penfold VK6NE

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Make your own Labels by Rob Abel VK2ERA . Tuning Mobile HF Antennas by Earl Russell
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Material should be sent di-rect to PO Box 300, Caulfield South, Vie. 3162, by the 20th day of the second month pre-ceding publication. Note: Some months are a few days earlier due to the way the days fall. Watch the space below the index for deadline slow the index for dead

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JAS-1, the Japanese Amateur Satellite wa eventually successfully launched, a few days late on August 12. In the AMSAT column this month Colin VK5HI, gives all the technical descriptions and appropriate formulae for the operation of JAS (see page 51).

back to the start of the satellite generation, Sputnik One. (Page 26). As promised last month, Drew VK3XU, presents

(page 16), the full construction details and circuit diagrams and PCB design for an 80 metre Direct Conversion Receiver

Conversion heceiver.

Each year prior to the beginning of the Remembrance Day Contest, a notable personality delivers an opening speech. This year, the guest speaker was Sir Mark Oliphant, a well-known Australian, Sir Mark has held many importan posts around the world including the position of Governor of South Australia. Ron VK3OM, has painstakingly transcribed Sir Mark's speech from tape and Ken VK3AH, researched and wrote a small insight into his life. (See page 28). Peter VK3KAU, is searching for more material for another cassette tape following on from the

great success of Volume 1. Peter is particularly interested in recordings of contacts on the former amateur hands such as 112 and 288 MHz. etc. See page 57 for full information.

The International Radiosport Association is an

independent international organisation dedicated amateur radio. This month they are conducting their first Championship Contest, the rules of which are published in the Contest Column. They also feature several awards. See page 48 for a description of the Association and details of some of their awards Interested in propagation on two metres. An

article, originally from Electron and translated by John VK4QA, for AR, describes some interesting experiments which are being carried out in Europe. Field Aligned Irregularity uses similar reflecting or bending mediums to Sooradic E. This may be "food for thought" for the VHFer (see page Don't forget JOTA, this month. And, if you

participate, a short story and some pictures wou be appreciated. 1986 issue of Amateur Radio, including

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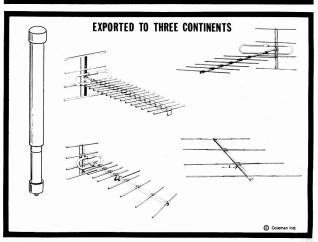


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Editor's Comment

THIS MAY CONCERN YOU!

Two matters of some importance have surfaced via our mailbox in the last few weeks. The first relates to a frequently recurring problem with this magazine. Once again we have almost run out of technical articles. Not material in general; our regular columnists usually manage to put together enough about contests, satellites, DX awards or whatever to fill their allocated space each month. But you, the readers, have always made it clear that what you want in each issue of AR is a good quota of technical information; and we all prefer it to be written by our own members rather than reprinted from overseas journals.

Unfortunately the supply has nearly dried up! The bottom of the proverbial barrel stares us in the face! (Your Editor has always had a weakness for well-mixed metaphors!) Where are all our technical authors? Probably, like the rest of us, they are so involved with making a living and keeping up with today's inescapable mass of paperwork that they don't even have time to get on the air, let alone build a new whizbang gizmo, let alone write a story about it.

Maybe though, some of you have a story
to tell — and time to tell it — but just don't

quite know how. A letter arrived recently from one such enthusiast. His query was 'How should I prepare an article on Topic X? What form of presentation is required?' Could there be others, similarly bursting with interesting technical material, who only need a few clues to set them writing? Rather than just replying to one, it now seems a good idea to address it to you all. First, we're not really all that fussy! We're so glad to get something we can use that we don't mind having to do an hour or two of editorial work to "lick it into shape". On the other hand, the less editing it needs the sooner you will see it in print. First, we must be able to read it. So, if possible, please be able to read it. So, if possible, pease type it, unless your handwriting is very very good. Please, please, double space the lines, unless you know your ability at technical journalism is so great that no editor could possibly want to change a single word! Those spaces are where all the orial changes have to be written in.

It helps to keep things tidy if you use standard A4 size paper (30 x 21 cm, or for old-timers, 11½ x 8 inches approximately). Leave a good wide margin at the left, at least 3 cm. Please don't write it all in block capitals, either by hand or on your old teleprinter! Use upper and lower case, just as it will be printed

If there are drawings, diagrams, circuits, board layouts etc (and without some of those it will hardly be technicall) you have two choices. If you are a skilled draftsperson you will do it yourself (on A4 sheets). If not, send us readable sketches

and leave it to us. We do like photographs. Black and white for preference, but even colour slides can be used if they are in sharp focus and have good contrast. But photocopies of all material are a no-no! They usually have little blemishes, streaks, spots or whatever, just where they will produce maximum confusion. Murphy loves photocopiers!

Has that triggered you off? Good. We are waiting for your first article. It might even win a Technical Award. Go to it! Second topic. Third Party Traffic. Without

pointing any fingers, various activities have become popular since third-party traffic was added to our privileges. Sometimes these involve not only our own friends and neighbours but also non-technical members of the general public. Another member wrote recently to point out that while wrote recently to point out that while handling unimportant non-commercial traffic for third parties is permitted, soliciting for it is NOT. We had so far seen no such prohibition in any of the new regulations, and replied to this effect. The response was a photocopy of a letter from DOC in reply to his query as to what is permissible. It states specifically "Amateur stations are therefore not permitted to solicit for messages on behalf of the general public". It was written some years ago, obviously after third-party was approved, but before the new Act became effective. It probably still applies. It might be best to assume that it does, until the new Amateur Handbook (still in preparation) removes all doubt. Need I say more?

A brief admission. I was wrong in July, when I wrote that television broadcasting began from the Crystal Palace 50 years ago. Only a week or two later, I found from n authoritative journal that it was the Alexandra Palace. Too late, it was in print! At least one eagle-eyed reader spotted the error. Dave VK3ZXU wrote in, not only to point out the error, but also sending some 1936 magazine items about the event. You will find them in this issue. Thanks Dave! 73

> Bill Rice VK3ABP Editor



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Ian J. Truscott's ELECTRONIC WORLD

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In order to help those installing this program on their system, an example of a simple three element Yaqi will be considered

The data for this example is presented below: Number of elements = 3

Frequency of interest (MHz) = 300 ELEMENT NO 1 Diameter = 0.002, Length = 0.475 ELEMENT NO 2

Volts in = 0 , 0
Position angle = 180, Displacement = 0.1
Diameter = 0.002, Length = 0.5
Series resistance = 0 ELEMENT NO 3

Volts in = 0,0 Position angle = 0, Displacement = 0.15 Diameter = 0.002, Length = 0.45 Series resistance = 0

Some of these items may require further explanation. The Frequency, in this case chosen to be 300 MHz so that length in metres equals length in electrical wave-lengths, is the frequency in megahertz that the array will be

analysed at. Element number one is the reference element, it is usually the driven element in an array. In this program it will be initially assumed that this is the case, although if need be, later on using the alter option, this can be changed. Subsequent elements to one can be driven or only parasitically excited. The way this is accomplished in this program is via the "Volts accomplished in this program is via the "Volts in" parameter. If, as in this example, parasitic only elements are required then their feed point voltage should be chosen to be 0, 0. If, for example however, an element was fed, by coaxial cable or other means, so as to be,

say 90 degrees out of phase with the reference element, but at the same level, then 1, 90 would be the appropriate response. Element two in this case is the reflector so, when its position is specified, it has an angle of 180 degrees to the reference. For this input, zero degrees is straight ahead, 180 degrees is behind, 90 degrees is above and 270 is below, with, of course, all points in between in the usual places. The displacement then in this simple case, becomes the element spacings. In more complex cases it must always be remem-bered that the displacement is with respect to element number one and not the next closest

This program also can allow for series resistance in the elements. This is useful for seeing the effect of non-ideal elements, or for other purposes which will be discussed later. In most cases, this will be zero. Element three in this case is the director and is thus located in front of the drive element.

The results from this array are given below:

Element 1 -0.284 + JO.234 -0.46 - JO.628 Element 2 Impedances Element 1 Element 2 9.5 - J25.7 0 + JO 0 + JO Element 3 18 2 dB

not perform in exactly the same way as predicted by this model. This will not usually be The impedances for elements two and three

to be parasitic elements. If desired the length of element one could be changed by small amounts until its impedance was solely real; ie it was resonant. This process does, however, take quite some time as it is necessary to recalculate the entire array after each change.

See the Appendix for more detail on inter-

mediate values, etc.

VALIDATION OF THE PROGRAM While, as I have said, this program for all its mathematical complexity, in only a model or approximation to the real world. It is always of some interest to compare the results obtained with those obtained experimentally theoretically by other methods. The program as it stands will only accept up to 10 elements, though this is only limited by the dimension statement which can, of course, be changed. With this in mind, the available literature was searched to find results that could be comparable. One source was eventually chosen. While it may seem difficult to believe that only one was available it must be noted that the vast majority of amateur literature does not usual with its absolute accuracy or test methods. In fact, even when dB figures are claimed for gain as being measured, it is rare that the reference is given; ie dB isotropic or

The chosen work is Reference 3 (b). In this article, James Lawson gives a good compari-son table when he is validating his model against the NBS* Yagi data. Part of this along with the results from the model developed here are given in Table 1. (* National Bureau of Standards (US)).

Table 1. (Partially from Reference 3 (b) with Antenna Gains in dBi

As can be seen there is reasonable agreeme has can be seen interes to reasonable agreement between the results obtained using this model and other methods. This is particularly gratifying when consideration is given to the assumptions and limitations of the model developed here. The worst deviation appears to be with the six element design, but even this rep-resents only some eight percent error. This difference is probably due to the accumulation of errors, as the amount of processing goes up greater than geometrically with increasing numbers of elements. What the above does indicate however, is that the model will be useful in predicting antenna performance with-out or/before building it.

ASSUMPTIONS AND LIMITATIONS It is vital for any user of this model/program to understand at least in part the limitations and assumptions on which it is based. These factors will determine where, when, and on what analysis can be done successfully.

Firstly, the array as analysed is in free space; ie not above a real ground. This means that antenna performance in a real situation that is not a considerable distance above ground, will too much of a problem as the major effects will be to raise the angle of maximum gain, plus to modify the input impedances.

Secondly, the array does not have a metallic boom or other support. Metallic structures like booms will have definite effects on perform-ance. Lawson in Reference 3 (c) discusses this and the first limitation and shows how this can be overcome. Once again this should not greatly affect the usefulness of this program.
Thirdly, there are limitations imposed by the

micro-computer and version of basic that the model is run on. Most owners of microcomputers are reasonably aware of their machines limitations in speed and accuracy. Fourthly, the gain routines integrate in 10 degree steps, if the array being analysed has

lobes much narrower than this incorrect answers will be given. It should also be noted that the fast approximate gain assumes an axis of symmetry in the antenna pattern in the zero egrees direction. Fifthly, and most importantly, this is only a

theoretical model. If great accuracy or very close to real-world answers are desired, then the only way to obtain them is by empirical methods such as those used by the NBS; ie many, many years of intensive "trial and error."
Not withstanding this, it should be possible to
'design" antennas using this model, and it will
certainly tell you if some new idea or configuration has merit without having to build it first. It must, however, be stressed that only the final test of building an array and using it will show how successful the design is. This model will at least get the builder pretty close to the ball-park if not in a front row seat. inally, the limitations caused by program

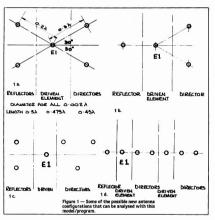
set-up must be allowed for. Foremost among these are the limit on number of elements; ie 10, the limit on all elements being about a half wave in length, only two dimensional arrays possible, and something that can be a real problem, the more elements in the array the longer it will take to run.

A NOTE ON MODELS

There are two basic types of models, the Empirical, and the Theoretical. Empirical models are those that have been determined after extensive experiments in actual working situations. They are formulated so as to give the actual results that have been obtained in the experiments. Theoretical models on the other hand are derived from first principles and are not linked to any particular situation. In most cases, while these two types of models will give very similar results, by definition the Empirical type will be more accurate. This is due to the need to make assumptions and simplifications in the Theoretical case. What then is the use of a Theoretical model? The reason is simple, there only exists Empirical models for a small number of cases, and if none exists then a Theoretical model is the

only option.

The model given here is of the Theoretical type. While Empirical models for Yagi antennas do exist: eg the NBS data for Yagis, they are somewhat limited in scope and can only be applied to the configurations on which they were developed. This model then, is primarily intended for those areas that have not received much experimental notice, or in perhaps more speculative areas. While the ultimate accuracy of its predictions may not be excellent, they



should in all cases give a good starting point for further investigations.

NEW ARRAY TYPES This is where this program comes into its own.

rou nave a bright idea for a new antenna but haven't got the time to build a hundred of them to find the optimum configuration. This pro-gram will allow you to effectively do just that in a reasonably short time and for very little cost. The number of different types of antennas are limitless, all it needs is someone to imagine

them. Some examples may illustrate this.

If you take the three element antenna given as a test example at the start of this article and add a 35 ohm resistor in the reflector; ie RS = 35 ohms, then the gain goes down. This is no surprise you say; but wait. The gain goes from 7.8 to 7.3 dBi because of increased losses etc. but there are other changes as well as straight gain. If you are a fox-hunter or just someone who cares more about front-to-back then, you would be interested in the fact that the front-toback goes from 18.2 dB to 36 dB. Furthermore. unlike similar designs that claim very high front-to-back, this figure is not very frequency sensitive. In practice, it is unlikely that exactly 35 ohms would produce this exact effect, but a value close to it should. A 100 ohm trim pot placed in the reflector and then trimmed for maximum front-to- back should however produce the desired effect. Another different configuration that could be investigated with

this program might be as shown in Figure 1a.

The dimensions etc, shown in Figure 1a are
not the result of a large number of iterations. Undoubtedly, if more time was spent something greater than the 9.6 dBi, that is the result for this case, could be found. This is at least of the same order as a normal five element Yagi and requires a much shorter boom. In fact, it is most similar to two stacked three element beams but without the phasing and feeding problems. Other interesting configurations are

also shown in Figures 1b. c. d. As can be seen, the possibilities abound, all that is needed is a micro- computer and some day you could have an array named after you. It is one very great advantage that amateurs have, there is a vast number of us, and quite a number have micros. The advantage that some researchers may have in access to very fast large computers is totally negated by the these articles, the amateur does have a lot to offer the science of antenna theory and design In fact, one could imagine a net where all participants have a computer with the program. Isolation of optimum dimensions could be achieved quickly if the net was co- ordinated to run a number of slightly different cases at once. The effective processing power would be quite large and very unique to the Amateur Radio Service. It might even give us something to do with packet radio besides rag-chewing true parallel processing!

COMPLETE LIST OF REFERENCES The following is the complete list of references used in Parts 1 to 3 of this series.

Antennas by J D Kraus, published by McGraw Hill, New York, 1950.

2. Vertical Phased Arrays by F Gehrke, Ham Radio July Yagi Antenna Design, a series of articles by J.L. wson, Ham Radio 1980. The particular ones referred to are as follows:

a) Performance Calculations page 22, January 1980. b) Experiments Confirm Computer Analysis page 19, ruary 1980. bruary 1980. c) Practical Designs page 30, December 1980. Antenna Theory and Design by W.L. Stutzman and G.A. iele, published by Jon Wiley and Sons, New York, 1981. 5. Antenna Theory by CA Balanis, published by Harper Antenna Theory by C.A. Balanis, published by Harper of Row, New York, 1982.

Another Van Antenna Design by S. laffin, Ham Bartin 6. Applied May 1984. L.

NOTE: In addition to the three articles by James Lawson quoted above, articles also appeared in the May, June. July. September. October and November 1990.

ine, July, September, October and sues of Ham Radio. TECHNICAL FOITORS NOTE: A copy of Paul's TECHNICAL EDITORS NOTE: A copy of Paul's program was obtained and with a few minor modifications, was tested using Microsoft Basic on a Microbee (CPM) bits version) and also on an IBM look-silier. The calculation results given above vert easily duplicated, results given above vert easily duplicated, with the published material. Some consideration could be given to the selective use of ouble precision variables to improve the calculation

APPENDIX A. The Cosine and Sine Integrals

These routines 14000 for Cosine Integral and 15000 for Sine Integrals can be checked and 1900 to Sine Integrals can be checked for accuracy against the following table. Note that the Cosine Integral will need the constant EU assigned before it will function correctly

| XX | CI(XX) | XS = SI(XX) | CI(XX) | SI(XX) |
|-----|-----------|----------------|-----------|-----------|
| SVI | 318 MICRO | 31(^^) | RAUS TABI | EQ. |
| 0 | Error | 0 | | |
| - 1 | 0.3376 | 0.9461 | 0.3374 | 0.9461 |
| 2 | 0.4230 | 1.6054 | 0.4230 | 1.6054 |
| 3 | 0.1196 | 1.8487 | 0.1196 | 1.8487 |
| 4 | -0.1410 | 1.7582 | -0.1410 | 1.7582 |
| 5 | -0.1900 | 1.5499 | - 0.1900 | 1.5499 |
| 10 | -0.0455 | 1.6583 | -0.0455 | 1.6584 |
| 15 | 0.0463 | 1.6182 | 0.0463 | 1.6182 |
| 20 | 0.0444 | 1.5482 | 0.0444 | 1.5482 |
| | | | * Ref | erence 1. |

B. The Intermediate Z Matrix for the Three Element Example (Variable A) (62.69, — 4.64) (67.33, 7.54) (60.43, — 7.10) (67.33, 7.54) (73.13, 42.54) (40.79, — 28.35)

(60.43. — 7.10) (40.79. — 28.35) (53.00. — 49.49)

C. Variable List C. variable List

NE = Number of elements in array

A (NF NF) B(NF*2+1 NF*2+1) X (NF*2)

12(NE 2) = Intermediate matrices used in

simultaneous equations.

— I, J, K, L, IT = General integer counters

— EC(NE, 4) = Element currents 1 = Mag, 2 = Phase, 3 = Real, 4 = Imag Phased stored in Radians

- EV(NE. 4) = Element voltages 1 = Mao. 2 = Phase, 3 = Real, 4 = Imag. Phase stored in Radians.

— EP(NE. 4) = Element position

1 = Disp (in wavelengths), 2 = Angle (in radians)

3 = X, 4 = Y, (3 & 4 not used here) EA(NE,2) = Element attribute 1 = Diam (in wave lengths), 2 = Length (in

wave lengths) - EZ(NE, 2) = Element impedances, 1 = Mag. 2 - Phase

XX = Input to sine and cosine integrals

XC = Result of cosine integral

XS = Result of sine integral PI = 3.141542654 P2 = Pl x 2 = 6.283185308

DR = Degrees to Radians = PI/180 EU = Eulers No = 0.5772156649

- 9. x. Z = Temp variables DM = Distance in wave lengths for mutual

ES(NE) = Element series resistance FR = Frequency of analysis RF = Restart flag 1 = Restart, 0 = Continue

NN = Accuracy count for cosine + sine

integrals = Sin(PHI

ST = Sin(THETA) CP = Cos(PHI) CT = Cos(THETA)

SI = Imaginary sum for gain and pattern SR = Real sum for gain and pattern

F2 = Array factor (and total pattern factor)

- F1 = Element factor
- UM - Maximum value of radiation intensity — OM = Maximum value of ri

TH = Theta (degrees)

- TH = Theta (degrees)
- PH = Phi (degrees)
- PH = Phi (degrees)
- PH = Directivity
- GI = Gain relative to isotropic in dB
- NC = Number of element to be changed
- XP, YP = Plot co-ordinates for pattern graphics

— XP, TP = Plot co-orum — MY = Maximum value DT = Thete (rediens) — D3 = Temp variable

D Statements Which May Not Exist in all Resics Replace with or Defint, I. J. K nment not really nece

sess On Greub

On Goto can be used to Goto a table of

Corrections to Part 1

The author has made the following corrections to Part 1 (see page 11, August), to clarify the calculations Equation 3a. should read: 3a. $F(\theta,\phi) = K^*(\cos(\theta)^*\sin(\theta)^*\cos(\phi))/\sin(\theta)^*\cos(\phi))^2$

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22000 Lecolo VV

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Equation 4 should read: 4. F(θ) = K*(I₁ < A₁ + I₂ < (A₂ + (2*π/λ)*S*cos(θ))

Equation 7. should read: 7. $F(\theta,\phi) = K^* \sum_{j} 1_j < (A_j + (2^*\pi/\lambda)^* S_j^* (\sin(B_j)^* \sin(\theta)^* \sin(\phi) + \cos(B_j)^* \cos(\theta))$

Reference 5, the authors correct name is Balanis. Some confusion is possible in the co-ordinate

section, (bottom col 1 page 11), as there is a false impression that X=1, Y=1, Z=1 is the same point as $R=1, \theta=45$ degrees, $\phi=45$ degrees. This is not the case. In fact the equations relating the co-ordinate systems are

given below. X=R*SIN(θ)*COS(φ) Y=R*SIN(θ)*SIN(φ) Z=R*COS(θ)

For

or $R = \sqrt{X^2 + \frac{Y^2 + Z^2}{2}}$ $\theta = ATAN (\sqrt{X^2 + \frac{Y^2}{2}}/Z)$ $\phi = ATAN Y/X$ The actual equivalents are: For X=1, Y=1, Z=1 B=17328=54736°4=45°

For $R=1.6=45^{\circ}$, $\phi=45^{\circ}$ is equiv to X=0.5, Y=0.5, Z=0.707

T DIST WAREED A 11500 of thinks on well







PUBLICATION OF COMPUTER PROGRAMS

Part of the technical editing of computer programs involves running the program. This has meant re-typing it from a listing supplied from the author. Many hours are spent by the editors entering the program. especially if, as does often occur, syntactical errors are introduced.

In future, to overcome this hold-up, alternative forms of program entry may be required; eg cassette, disk, or via a modem. This will enable quick editing. If we do require the program in one of these alternative forms, we will provide the blank cassette, disc, etc, or make the telephone call in the case of modems.

Finally, a word of advice. Computer programs on their own do not make good articles. Please include with any program a description of your algorithm. Articles are much more interesting when they include, not just a description of the how but also the why. Please use your blackest ribbon for your print-out.

SATELLITE TELEVISION

Australia's commercial television networks have received permission from DOC to relay their programs using AUSSAT. Regional stations will be le to receive the capital city programs and rebroadcast them in their viewing are

An encoding system will be used for the next six to 12 months, designed to limit unauthorised reception by electronic enthusiasts and others.

Because television encoding technology is new to

Australia, the networks will replace this encoding

system with one which will be totally secure.
The networks have warned householders in country areas about decoders they may be offered. The decoders will not provide satisfactory areas about decoders they may be pictures and sound during the interim period ar will be useless when the totally secure permane

system is introduced. BLUE CHIP COMPUTERS

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\$379 CHIRNSIDE CA-35DX 5 et tribander on 6m long
 CHIRNSIDE CA-35DX 5 et tribander on 6m long
 S479 boom, uses 2 x 10 m elements . CA-5 s/s 5-band vertical, 6m long \$169 \$30.00

COAXIAL CABLE RG-213 by Benelec ... \$2.50/m

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o/p. AC/DC transceiver. KURANISHI FC-965 . \$219 Converts 0.5-60 MHz signals up to 60.5-120 MHz thereby allowing MW/ SW/Low VHF reception with the FRG-965 or similar rx.

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AN AMATEUR RADIO **ENGINEERING PROJECT**

Part 2 — A 10 MHz Frequency Reference

Kenneth Kimberley VK2PY 21 Nicoli Street Lakemba NSW 2105

The first part of this article described the results of a number of experiments designed to explore the characteristics of crystals and crystal oscillator circuits

crystals and crystal oscillator circuits.

Part two describes the circuit,

construction details and the measured. performance of a temperature controlled crystal oscillator based on the lessons learned in the previous article Now read on

Some oscillator manufacturers oven the crystal only leaving the overall stability to the vagaries of the associated components. The design described below, controls the entire circuit right scribed below, controls the entire circuit right down to the last nut and bolt. The plan is to eliminate, as far as is possible, frequency changes caused by oscillator capacitor change, voltage fluctuations, internal changes within the transistors, not forgetting the mechanical changes.

330) and 990 nF (3 x 330) canacitors at C1 and

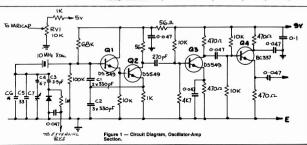
The use of multiple components made it a The technique is to gradually increase C1 and C2, whilst monitoring activity and outout. A point will be reached where oscillation will not readily commence, hence slightly lower values duce the reaction of internal change within the transistors to a minimum

The crystal itself was chosen to work into a 40 pF load, but C1 in series with C2 is much higher than 40 pF. However, this problem is higher than 40 pF. However, this problem is overcome by the stratagem of connecting the various trimming capacitors in series with the divider so that the total now becomes = 40 pF. At this point, mention is made of what appears to be a rather complex trimmer set-up. The silicon power rectifier (IM4004) is used as a "varican" Dedicated varicas diodes are much

stability. Hence, their use should be avoided wherever practicable. Not withstanding the previous comment circumstances almost dicprevious comment, circumstances almost dic-tate the use of one at C7. However, any prob-lems here are partially circumvented by limiting the total available frequency variation to about 100 Hz. The NPO ceramic capacitor C4 (4.7 pf.) is used for this purpose. Stability requirements make the use of high class capacitors around the oscillator mandatory. To this end, C1 and C2 are styroseal, C3 through to C6 are NPO The trimmer C7 is a multi-turn 17 nF unit

available from Microwave Developments and

available from Microwave Developments, and seems quite stable. In a dispersion of the dispersion of a dispersion of a distorted waveform. This is of no real concern as it will be converted to TTL in the forthcoming square-wave generator. If this represents a real problem it may be readily filtered by a tuned



Before detailing the construction, a brief circuit description will be presented, refer Figure 1. The signal part of the unit consists of four transistors. Transistors Q1 and Q2 function in the good old reliable Colpits circuit, Q3 buffers the output whilst Q4 is an impedance converter. It will be observed that the first two transistors are Darlington connected. This configur-

ation gives a greatly increased gain over a single transistor leading in turn to a relatively high input impedance. Higher values of resistngn input impedance. Figher values or resist-ance may now be used in the bias network. Practical values of 68k and 100k were arrived at. These high values tend to keep the crystals operating Q higher than that normally attain-able with one transistor. This in turn, narrows the bandwidth and hence less oscillator noise. The Darlington allowed the use of 660 pF (2 x

more expensive and do not work any better in this application. Note that RV1 is used as a remote control of its capacitance. This feature is to enable the correction of small drifts. caused by aging, etc, without the necessity of dismantling the unit. The 3.9 pF capacitor C3 limits the available adjustment to

approximately 30 Hertz.

C5 and C6 must be adjusted on test and this is done in the following manner. Set C7 and RV1 to mid-point then adjust C5 and/or C6 by trail and error until the frequency is as close to 10.000 MHz as possible. Consideration may be given to fit a small trimmer plus capacitor

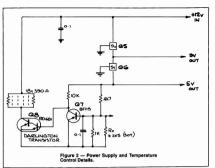
The use of a trimmer here makes for easier adjustment. However, mechanical trimmers have a notoriously bad reputation for uncertain

circuit connected externally circuit connected externally.
Additional buffering and output voltage is obtained via Q3, a type DS 549. Note the lowish coupling capacitor C8 which was kept down to 270 pE. This value was selected as a compromise between loading and output. Q4 (BC337) is used as an impedance converter to drive the

output coax.

As it is intended to derive the power require As it is intended to derive the power require-ments from the coming square- wave gener-ator, the supply was set at twelve volts. There being two main reasons for this, one being that it may be required to encourage the high fre-quency operation of reluctant CMOS integrated circuits in the generator, and the other to keep the current lower for a given power in the

Page 8 - AMATEUR RADIO, October 1986



CIRCUIT DIAGRAM

There are two or hoods degulaters provided within the own emclosure being nine and two volts respectively, fees Figure 2), the former volts respectively, fees Figure 2), the former opinion to the first control sensor. Most semi-conductors are heat sensitive in one way or other decision to over them thus ensuring a much more constant output. Note that the decision to over them thus ensuring a much more constant output. Note that the hence the rine volt is output, and the five, treatly regulated. Therefore, the power source of a single supply line also reduces by two the number of conductors going into the enclosure.

OVEN HEATER

The heater element, used in the final version, consists of 18 parallel connected 390 ohm metal film resistors.

The energy is supplied from the 12 volt regu-

lated supply, control being via the temperature sensing element Q7 (BF115) driving another Dartington (Q8 BD681). Q7 should be mounted in close contact with the crystal cover; is soldered.

The final operating temperature is set by "Fl" and needs to be adjusted on test. A variable resistor is not recommended due to their doubt ful mechanical stability. However, a multi-turn trimmer is used to ascertain an approximate value. Subsequently replaced by a metal film resistor of the next lower preferred-value and a 500 ohm multi-furn pot (RV2).

All of the electronics is housed inside a die-

All of the electronics is noised inside a discast box which is then surrounded by styrofoam, etc. Further insulation and a neater finish is obtained by mounting the unit into a plastic Zippy Box.

Figure 4 — Mechanical Details.

MECHANICAL DETAILS
Describing the constructional aspect of this unit appears to be a more difficult proposition than actually doing it, however, please bear with it, even though the following may become

with it, even though the following may become a little tedious. (See Figure 4). Proceed as follows — roughly shape the H5510 Board to the internal outline and dimensions of the die-cast box (DCB). Next, out clearance notches around each of the four corner blocks. A quick trim with a file and it should fit snugly, resting on the eight webs moulded into the bottom. A three militeret hole is drilled in The template, thus produced is used to mark the location of holes in the base. Remember to

drill from the inside and de-burr. The DCB is then used in a similar manner to mark the mounting holes on the copper side of the PCmaterial. Ensure that they fit together symmetrically. After drilling and countersinking (glass side),

After drilling and countersnking (glass side), screw the two together, complete with lockwashers under each nut. A six millimetre hole should now be made in the control cable end of the DCB. Temporarily run a second nut and flat-washer

down each of the four 2.5 mm screws. These will serve as an adjustable mount for the electronics board, which should now be dropped into place. The vertically mounting heater resistors, being the tallest of the components, should be used to verify the lid clearance. Move the height adjuster ruts for equal spacing top and bottom, and then lock them into

ing top and bottom, and then lock them into place using a little paint, etc.

The method used to mount the DCB into the lifty Box is similar to the above, hence this part.

will be left to the constructor's imagination.
The two pieces of one millimetre bakelite, etc. are used as an insulated base plate. Originally a scrap of aluminium sheet was used, however this proved to be unsuitable due to its good heat conductivity, degrading temperature

At this stage mark out and drill a four milimetre hole in each corner of the insulated base. The main earth wire connects from a solder lug, under one of the mounting nuts, through the end of the lifty Box onto the PC-

control

The remaining scrap of PC-material becomes as insulator by being cut, trimmed and glued (metal side down) to fit neatly into the base between the webs and the 2.5 mm nuts.

Provision is made for the interface cables via a six millimetre hole in the Jiffy Box. Ensure that the two six millimetre holes do not align with each other. The idea being to reduce unnecessary heat loss. The constructor may, at this time, care to provide a tag terminal handy to the outside six millimetre hole.

Obtain and cut to size the various insulating pieces, which will later be fitted between the six faces of the DCB and the Jiffy Box. Satisfactory material includes styro-foam, old PCmaterial, mica, and bakelite.

WIRING

That about completes the metal bashing, so now we will look at the wiring. The first stage to be addressed is a general layout of the board. Allocate about 50 percent of the available space to the oscillator; le Q1, Q2 the 10 MHz crystal, its socket and the various tuning capacitors.

The remaining space accommodates Q3, Q4, Q5, Q6, plus associated minor components, as well as terminating pins, etc.

Note that pins are provided for all parts that

could require changing during the adjustment routine. Pins are also provided for the semi-conductors and the crystal socket. With the benefit of hindsight, it may have been prudent to use a wire-in type of crystal, thus eliminating a possible future trouble spot.

The electrical earth bus system is installed

as follows: A 10 mm strip of copper (or in plate) goes across the oscillator end of the board, fleaving one clear row of holes which will be used for the sharpesture control transitions and drilled through the earth strap to coincide with those existing in the electronics board. Likewise, fit a sodder lug over the remaining holes are connected to glogather by bars eith ill number 18 gauge wire, which is then extended parallel to, and approximately eight millimeters from the bottom edge, along to the copper strip. Re-resistors.

he socitive supply rail runs along the topspaced as per the earth line. However, it stores where the stores were the stores and the stores and the should be immediately sejacent to the collector of 32. Bare tinned wire is again used and is soldered to strategically placed pins. The 33 end is extended by means of the decoupling resistor and finishes with another pin opposite 32 collector. Prior to the actual assembly, it is strongly

Prior to the actual assembly, it is strongly recommended that all of the component parts be placed on the bench top and moved around until a suitable configuration is arrived at. The layout of the remaining direction that the component of the property of the property of the property of the property of the bottom of the board, whilst the signal path is from the left to the right.

With the above in mind, insert the clins for

the transistors. The base pins for Q3 and Q4 should be on the centre line, emitter Q1 and collector Q2 likewise. Now wire in the various resistors associated with the transistors. These go direct from the supply rails to the transistor pins, via conveniently placed lands on the board.

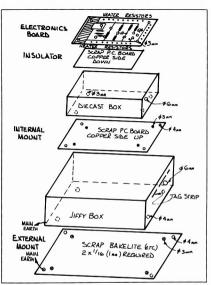
The control pins are now inserted and are grouped vertically close to the right hand end of the board. At this stage, find a suitable position for the two regulators and insert their respective pins.

Now we are coming to the actual oscillator. This is wired in a similar manner; ie a judicious mixture of pins and tinned wire. The crystal is placed flat on the board and extends approximately half-way over the copper strip to which it is immy connected (soldered) by a timb their assigned position, where necessary connect together and then solder in the various

tuning capacitors

Mention must be made of the temperature sensing transistor, Q7. This is connected to its

AMATEUR RADIO, October 1986 - Page 9



circuitry via pins at the extreme end of the board. These are positioned in such a way that the transistor may be bent over and soldered

onto the crystal can. The remaining components, including the semi-conductors, are now wired in. The control wires for the varicap and the temperature sensor should be routed as far as possible from the oscillator circuitry and made rigid by gluing

to the board. The time is rapidly approaching, when the constructor begins to see some results. The unit may now be powered up, but first switch on the station frequency meter or digital readout equipped transceiver and allow them to warm_up. Next, run five wires temporarily, three to RV1 and two to the 12 volt supply.

Connect the counter, etc, to the 10 MHz

output pin, switch the supply on, stand back and carry out the old "smoke test." If all is well,

shift attention to the counter which should be counting away merrily.

The frequency should be quite close to 10.000.000 provided that the specified crystal and components were used. Note that other manufacturers equivalent components may be

organised as follows: 1. Set RV1 and C7 at mid-point.



Internal View

used as long as the calibration tolerances are

Preliminary frequency adjustments may now be made; remember a final touch up will be required later. C3, C4, C5 and C6 are

2. Leave C3. C4. and C5 as specified. 3. Trim C6 until frequency is very close to preferably on the high-side. (Strays will be higher when the board is in the DCB).

4. Rotate C7 from minimum through to

maximum. Hopefully, the frequency excursion will be in the order of 100 Hz. If not change C4 5. Return C7 to mid-point and rotate RV1 from minimum through to maximum. This time the frequency excursion should be about 30 Hz.

When satisfied with the above adjustments mount the oscillator into the DCB, not forcetting the under-board insulator and spring washers under the fixing nuts.

FITTING TEMPERATURE CONTROL

At this stage a little more metal work and wiring is required. Firstly a six millimetre hole should be drilled in the lid immediately above C7. A

be orimed in the iniminediately above Cr. A second hole needs to be provided for the thermometer used in setting up.

This is kept away from both the crystal circuitry and heater resistors. A point midway between Q1 and Q2 and a little above the centre line is a good spot. Even so, inserting the thermometer moves the frequency a few

Hertz. The BD681 oven controller should now be fitted to the inside of the lid. Mount it opposite the thermometer hole and as near as practical to the bottom edge. The transistor leads should face away from the oscillator circuitry and arrangements made for the connections to come out of the lid. These wires should be firmly fixed so as to prevent any possible

instability. The method used by the author was as follows. A 10 mm hole was drilled in the lid and then covered by Vero-board. Three circuit pins were then inserted and Q8 wired to the appropriate tracks.

INSULATION

The next step is to mount the DCB as follows. Fit the thermal insulator into the bottom of the Jiffy Box and then screw in the DCB. Run the control; wires, etc. through to the tag strip at one end, whilst the earth wire goes out though the other.

Make one last inspection of your work, and if it is okay screw the lid firmly onto the DCB. Next pack insulation between between the four edges of the DCB and the Jiffy Box. Cut another insulating piece and lay it on the top.

TEMPERATURE ADJUSTMENT The oven operating temperature is set as

follows. Temporarily connect a 10 kohm multi-turn pot, or decade box to the Sensor Control Points and set it to maximum "R." Next insert an ammeter in series with the power supply, and place the thermometer into the designated hole. Ensure that it rests on the oscillator board and is safely supported, externally, so that it cannot fall over and break. (Thermometers are

too expensive and inconvenient to replace). Switch the supply on and observe the ammeter. At this stage, the oven heater should be biased off and the meter will indicate only

be based oif and the meter will indicate only the current being drawn by the electronics. Carefully adjust the 10k pot whilst monitoring the ammeter. A point will be reached where the current will gradually increase to approximately 500 mA. Now "back-off" the pot a little so that the heater current drops to 450 mA.

The temperature inside the box will commence to rise and the current slowly decrease until stabilising at around 200 mA. Carefully repeat the adjustment several times until the temperature gets to around the 60 degree Celsius mark.

SENSING RESISTOR When the indicated temperature reaches that Unit showing the Frequency Adjusting and Thermometer Holes, Over Element Wiring and Heat Insulation.

which is desired, switch off, disconnect and measure the set resistance of the multi-turn. Now obtain a metal film resistor of the next lower preferred value, build it up to approximately 250 ohms lower than the measured value of the "preset

This network, along with RV2 (500 ohms) is then soldered onto the tag strip.

The author's model required a resistance of 2.615 kohm and was made up with a 2.2 kohm in series with a 220 ohm unit. RV2 making up the final value.

STABILISING TIME Re-power the unit and allow it to settle for at

least one hour. The relatively long stabilising time is due to the low heater power of six watts. and the large thermal mass of the oven enclosure. If the temperature is other than desired, trim

RV2 a little, again allowing a similar settling When all is well, leave the unit run overnight.

This long run will eliminate an initial tendency to hunt and should ensure that the temperature gradient within the stabilised oven is minimal. RV2 may require further trimming after this period

FINAL FREQUENCY ADJUSTMENT The stage has now been reached where the

final frequency adjustment is made. Assuming that the crystal oscillator has been running continuously for at least one week, proceed as Method One - This is used where a good

counter is unavailable. a) Tune to WWV or a similar station on a eneral coverage receiver

general coverage receiver.
b) Set the receiver to AM-mode — narrow selectivity - and plug in headphones. c) Tune C7 for maximum "C" through to minimum whilst carefully listening to the beat.

The zero will be a little difficult to detect due to

the modulation present. With care it should be audible as a low pitched note of approximately 50 Hertz at each end of C7's travel. As C7 is rotated, the note will become lower until it falls below the ears low frequency response, and will reappear on the other side.

Note the zone of inaudibility, and set C7 at the middle. The average ear fails at about 25 Hertz and therefore the area of uncertainty will be ±25 representing a possible error of 2.5 ppm. However, in practice, it should be better than 1 ppm. The use of a CRO and a simple low pass filter (150 kohm resistor and a 0.1 mF capacitor) should assist in the setting of the zero point to better than one Hertz. Use RV1 to do the final trimming.

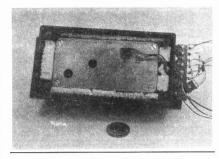
Method Two — Using A Frequency Counter The counter used by the author for all of the development work was a Leader type LDC 85, which has an ovened time base and is specified accurate to ± 0.03 ppm ± one count.

Any error introduced as a result of the stated tolerance may, for practical purposes, be neglected.
a) Switch counter on and allow it to stabilise for

several hours. b) Set time base to one second. c) Adjust C7 until counter indicates 10,000,000.

d) Change time base to 10 seconds trim, with RV1, to 0.000.000.0 (overflow)

Method Three - Lissajous Patterns The equipment requirements here are: i. A CRO which has both the vertical and horizontal deflection circuitry available for the inputing of



external signals and ii, an accurate reference frequency source. Maybe a counter with a lower resolution than required for Method Two. but utilising an ovened crystal.

a) Have frequency reference fully stabilised.

b) Connect reference to the horizontal input and the oscillator under test to the vertical (or vice-versa) c) Adjust levels to obtain a convenient sized

pattern. d) Carefully adjust C7 until a nearly stationary circle is displayed.

e) Fine trim with RV1 f) Remove test equipment but leave your gerillator running

Method Four -This method is used where both deflection circuits are not accessible. In this case, a standard dual beam CRO may be used.

Proceed as follows: Connect "the frequency reference". whatever, to channel one and then select time base to 0.1 uS per division, the gain to give a picture of about four divisions high, and the synchronising to channel one.

Feed the oscillator under test into the other input and again set the controls to give a similar sized picture. Slowly move C7 whilst watching trace two.

one side to the other as the trimmer is adjusted. A point will be reached where the direction reverses. Stop, when this appears, you have gone too far. Again use RV1 as a final trimmer and set it so that both traces are rock steady.

c) Trim with BV1.

This method may be used when only a simple single beam CRO is available. Connect both signal sources together via a suitable resistor pad, capacitors and diode. Thus forming a simple mixer. a) Connect the output from this mixer to the CRO and adjust gain to suit.

b) Adjust C7 to near zero beat. Each of the above methods has its own shortcomings: The main problem here is the

modulation WWV. 2. The accuracy of the counter time base. The accuracy of the reference source. 4 & 5. As for three.

The author used Method Two for all of the development work and Method Four for the final adjustment. However, whilst overall accuracy is highly desirable, the main requirement is really stability and repeatability. AGING

This parameter is rarely mentioned in the general run of amateur radio literature, as it is sually well masked by other aberrations. However, this project has been developed to a The main causes of aging are contamination within the holder that is redistributed with time,

slow leaks, mounting and electrode stresses which are relieved over a period, and "oil-canning." The latter problem is where barometric pressure acts on the crystal can. Positive aging is the most common type and is usually due to the transfer of contamination the vibrating surfaces. Generally, negative aging is due to leaks in the can. Following the frequency setting, the oscillator was left running continuously for a

period of 300 days, the frequency was measured and plotted daily. In the interests of consistency all measurements were taken at the same time of the day. Figure 3 shows the results in a compressed

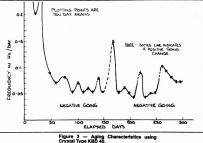
form. The readings for each 10 day period were averaged and then plotted. The graph shows that the aging rate exceeded 0.1 Hertz negative per day for the first seven weeks. and then settled down to about 0.06 Hertz until day 150. An unexplained positive movement developed for the next 20 days, then returning to 0.06 negative.

The change, over 300 days, totalled some 17 Hertz, which averages out to 0.057 per day (0.006 ppm). This represents a yearly rate of 2.1 ppm and compares favourably with the generally accepted industrial rate of 3 ppm for sistance welded holders. Further improvement may be had by using a

crystal with a cold welded can or, even better, a glass mounted type. These types have an aging rate of about two and one ppm respectively. A dual oven; ie one within the other, would also help, however one has to stop somewhere or end up emulating the famous Dodo Bird and its ever decreasing circles.

Moreover, proceeding along these exoteric

paths leads to more troubles than both AMATEUR RADIO October 1986 - Page 11



Pandora and Murphy together could ever dream up. Not the least being the measuring accuracies required and of course that ever present problem — cash!

SUMMARY OF RESULTS At this point, the project was terminated and a

summary of the results were obtained. They are as follows: Nominal Frequency = 10.000,000 Hertz = ± 0.1 Hertz = 0.01 ppm

Daily Stability (including aging) Aging Rate per 10 Days Yearly aging Oven temperature

Oven Temperature Oven Temperature

Oven Current (during

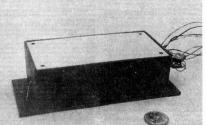
= -0.6 Hertz = 0.06 ppm = -22 Hertz = 2.2 ppm = 55.5 degrees Celsius at 23 degrees Celsius Ambient = ± 0.1 degrees Celsius at 23 degrees Celsius

Ambient = 54.8 degrees Celsius at 43 degrees Celsius Ambient = 500 mA (= 6 watts)

Oven Current (sustaining) = 200 mA (= 1.2 watts) It is imperative that this unit runs

continuously otherwise the performance will be degraded. PARTS LIST

18 4 3 2 5 1 1 RO 10k Multi-turn Pot



Overall View of the Completed Unit.

1 660 (2 x 330) Styro R 2831 (3 x 330) Styro R 2831 C1 660 C2 990 C3 3.9 NPO C4 4.7 NPO C5 33 NPO C6 Adjust on test C7 17 Multi-turn See text Microwave Developments R 2839 47 nF Ceramic B 2327 B 2380 mi-Conductor 549 Transistor 337 Transistor 115 Transistor BD681 Darlington N4004 Silicon Die Cast Box (100 x 50 x 25 mm) Jiffy Box (130 x 68 x 41 mm) IC Board (Cut 1 H 2221 1 H 2763 1 H 5610 Scrap Board H 5590

Circuit Pins Screws, Nuts, Solder Lugs, etc.

TELEVISION

The inauguration of an "experimental" regular television service by the BBC in November 1936, aroused sufficient public interest to justify television making steady progress towards a wider popularity. The proviso was that "so long as good

programs can be maintained."
The opening ceremony was conducted alternately by the Baird and Marconi-EMI systems.
The transmitting apparatus was installed in the Alexandra Palace, with each company installing separate equipment.

The Baird system was on 240 lines whilst the Marconi-EMI was on 405 lines. In the Baird system, three different types of

scanning equipment were provided — for studio work "Spotlight" scanning was used — a beam of light was focused through a small water-cooled rectangular window situated at the top of a scanning unit. The scanning disc revolved at 6000 RPM with 240 apertures arranged in four spiral traces, whilst a second disc had a spiral slit and acted as a shutter so that only one of the 240

holes was exposed to light at any one instance.

The transmitter used crystal control, the crystal oscillating at 1.406 MHz, with the output being passed through amplifiers and frequency-The Marconi-EMI system was completely el

tronic, with an Emitron camera employed as a link between the visible and electrical. The basic unit, a pulse generator, provided the necessary pulses for operating the camera and synchronising sig-

-From Wireless World, 1936

INTERNATIONAL E-POST

A new electronic mail service, available through Australia Post, guarantees next working day delivery from Australia to over 20 000 towns in the United States of America.

The service, International E-Post is aimed at the Australian and American businesses who require fast delivery. Documents are hand delivered to an

rissi derivery. Documents are hand delivered to an electronic mail-equipped post office and then transmitted to a post office in the US. The message is then printed on high quality paper complete with company logo and signature if necessary and then delivered by courier or mail to its final destination.

DESIGN OF A BAND-PASS FILTER FOR THE TWO-METRE BAND

B P Dilworth VK7BD 4 Anson Street, Waverley, Tas.

Having recently acquired an older style solid-state twometre FM transmitter/receiver. on air tests showed that there was noticeable output on 216

144 MHz 8MHz CRYSTAL -- 216MHz UNWANTED

out of band signals. Not wishing to alter the design of the transmitter as in (a) (with the possibility of introducing more complex problems) it was decided to choose alternative (b) - design a suitable 'out-board' filter. This choice was also chosen as, having built very simple two-valve type transmitters (Mini Tran 2 — March 1962 AR), the filter could also be used to "clean" this

After studying the various alternatives, I finally settled on the coaxial cavity type, as described in various ARRL publications, but modified to suit locally available materials.

measurements — this was done as older copper pipe was used having imperial dimensions.

The diagrams should be self-explanatory. All rods and half-inch pipe are soldered to the brass cap. The capacitor C1 is fitted between the outer and inner pipe. It also provides support for the top of the inner pipe so the use of a mechanically strong ceramic insulator is not required. Whilst on C1, use a type with a lockable shaft or stiff movement as this sets the passband and should be 'bump' proof. (The Q of the filter is high and, as such

minor variations in C will cause a significant variation in the resonant frequency of the filter - Technical Editor).

ON AIR TESTS

The filter was connected between the transceiver and antenna and peaked to give maximum transmit output power to the antenna. There was no noticeable change in signal reports given with the filter in-line or removed from circuit.

A portable colour television was placed near the transmitter and channel 11 selected. With the filter out, the television was overloaded and the received program totally lost. When the filter was connected, the television showed no signs of interference - thus the problem was

Running one watt of transmit output power with the two-metre and television antennas = one metre apart only slight interference occurred. This also happened with a commercially built transmitter, so pure front overload of the television (a mid-range Japanese model) is suspected. REFERENCES:

QST, 1964 — ARRL Amateur Radio Handbook 1978 — ARRL

DECISION APPEAL Jack Ravenscroft VE3SR, has decided to appeal the Ontario District Court decision that put him off

the air and forced him to pay damages and costs for allegedly interfering with the operation of electrical and electronic equipment in a neighbour's home Although no additional court appearances will

Although no adultional court appearances him be involved, the appeal process will take many months and cost many thousands of dollars. From CRPL News April 30

BUYING OR SELLING GEAR?

HAMADS MAKE IT HAPPEN FAST

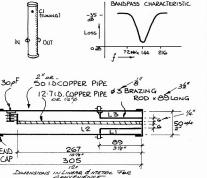
This is 'spot-on' on channel 11 (our local television translator output), which caused television interference when transmitting. SIGNAL Two-metre Transmitter — Typical of Popular Home-Brew Designs. SOLUTION TO PROBLEM The 216 MHz output was of a low level but it still caused problems in the local area. The DESIGN Two possible solutions were considered: (a) re-design of the PA-stage to further The design is shown in the accompanying unwanted output was a result of the transmitter's design for no filtering was diagrams - note the use of older imperial suppress unwanted output provided in the output stage — this situation is (b) add an external bandpass filter to reduce not uncommon amongst some simpler

SOURCE OF PROBLEM The 216 MHz output is a result of the third harmonic output of the 72 MHz stage; ie the 72

transmitter designs.

MHz signal is doubled to give a desired 144
MHz output, but some tripling to 216 MHz also (This problem is a common result of

tries problem is a common result of excessive drive applied to the doubler stage. It is always good practice to include a series resonant trap at 3xf across the input of PA — Technical Editor).



Coaxial Cavity Filter for the Two-Metre Band.

SMALL SIGNAL BJT AMPLIFIERS

Don Law VK2AIL RMB 626, Adelong Road, Tumblong, NSW.

How to use the B.IT from square-one without resorting to copying a desian.

Although a vast number of Bipolar Junction Transistors (BJT) have disappeared into one or another form of *chia* it is still easier to build say. a microphone preamplifier or whatever, with a BC109 than to reach for a 741 op-amp.

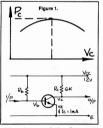
This article describes how to use the BJT from square-one without resorting to copying some-one elses design. Since thermal runaway problems went out with germanium devices, a simple circuit as described in Figure 1 may be

(In any event, providing that when

$$V_{\epsilon} = V_{\epsilon\epsilon}/2$$

the collector dissipation is within the manufacturers rating, thermal runaway cannot occur because whether V increases or falls from this value P, reduces.

$$P_e = V_e \times I_e$$
Work it out for yourself).



It is usual to arrange for the collector current It is usual to arrange for the collector current (I) to be around 1 mA. (The manufacturers beta spread and other data are usually given at this current). To obtain the maximum undistorted voltage output swing, R, is calculated to the collection of the collection o lated to drop half the supply voltage, V ... Thus with a 12 volt supply:

 $R_e = (V_{ee}/2) / I_e = (12/2)/1 \text{ mA} = 6k$ R is found by experiment and may vary between 270k and 1M or more. The voltage

gain (A) is quite high and is found by dividing a magic figure (26 to 30 mV) by I, (mA) and then dividing the result into R.

ie 6000 divided by 30/1 = 200

This is the 'unloaded' gain. When coupled to another circuit the effective value of R_c and hence the gain is lowered by the input Z of the next stage being in parallel with R_c.

Figure 1 is quite adequate for a one-off amplifier but suffers the disadvantage that a replacement device in the event of failure would be unlikely to have the same beta so R. would have to be re-selected also.



Figure 2 largely overcomes this problem by providing a large degree of self-adjustment due to DC negative feedback. A BJT with a higher beta would have a lower collector voltage were it not for the fact that less voltage across R reduces I, which in turn reduces I, thus V, tends to stay where it was, and vice-versa. Some AC negative feedback occurs but because R_s is large compared to the base input impedance, the voltage gain is almost that of

Figure 1.

Where a fixed, low order gain is required, Figure 3 may be used. That is a line amplifier for a microphone with a gain of 10



Here the gain is 'built-in' and is the ratio of R /R... An added advantage is the reduction of distortion due to negative feedback via the unbypassed emitter. It may also be advantageous that the input Z is considerably increased; le as before:

$A_{..} = R_{.}$ divided by 30 mV/I, (mA). (The latter quotient is called little re) but in Figure 3 the value of big R_c must be added:

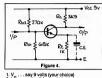
ie A = R, / (re + R,) but because R, is large compared to re.

A. = R/R, is near enough. In both Figures 2 and 3, R, will only be half the value of Figure 1 because the voltage across

R, is halved. The voltage across R., the BJT and R., should be arranged so that V_{sc} and V_{sc} are

and I, = 1 mA the values given are satisfactory. Figure 4 is the full blown beta independent arrangement which, once designed, is guaranteed to work with any transistor of that type out of the box.

Three bits of information are necessary: ie a BC109.



2. I. .. . say 1 mA (your choice) 3. Beta . . . say 400 (manufacturers data) There is no reason why V_E should or should not be about one-tenth of V

Since R_e will be sufficiently large to compensate for beta variations (between devices) and because one-tenth of V_m will not devices) and because one-tenth of V will not be missed, this proportion seems sensible. At I = 1 mA and because I, is so small, I, = I, (near enough).

So Re = Ve/Ie = say, 1V/1mA = 1k This leaves 8V across the BJT and R, so R, must drop 4V DC.

R. = 4V/1mA = 4k Using the lower value of the beta spread (400 to 800) makes

Since the 'bleed' current through R_{s1} and R_{s2} must be large enough to stabilise the base voltage (V_s) a value equal to I_s x 10 is chosen.
(Lower currents may be economical when using battery power but beta independence may suffer. Higher values, and lower resistor values may unnecessarily lower the input impedance of the circuit). Thus

$$I_{ma1}$$
 + $_{ma2}$ = 25 μ A and $(R_{a1}$ + $R_{a2})$ = 9V/25 μ A = 360 k
There are several ways of calculating the

voltage divider but the simplest is probably by proportion: ie

$$R_{b1}/R_{b1} + R_{b2} = V_{b}/V_{cc}$$

R₁/360k = 1.7/9 (V₁ = V₂ + 0.7 for Si) By cross multiplication:

R_{s1} = 1.7 x 360k/9 = 68k. R_{s2} = 360k - 68k = 292k The preferred values given in Figure 4 will not

adversely affect the operating parameters. With R_E unbypassed A_c = 3.9. A_c with R_E bypassed is approximately R./re = 3900/30 = 130.

Calculations using different data are an

interesting and rewarding exercise and it is a worthwhile project to program the computer for quick results. You will find, for instance, that varying R, has little effect on I, (unless it is so high that the BJT is 'bottomed', ie V_e is too low; one or two volts), a popular misconception. Why should it, looking back into the collector you have an extremely high Z. (A NiCad charger maybe? A constant current source).

Achieving maximum gain is also a giggle. For

very small signals (out) V_c may be lowered; ie with V near V 22 then you will have to reduce I also. Since A = R/re and because re = 30 mV/lc you will find it quite a battle. Increasing R, and V, (and modifying the base voltage divider) will produce greater gain but do not exceed the makers maximum V_c.

Input Z is $R_{_3} / / R_{_{32}} / R_{_{base}}$ and since $R_{_{base}} = beta$ x re = 12k then $R_{_3}$ (in particular) does not seriously reduce the 1/P Z. Output Z is 3k9 unloaded but nearer 2k7 when

coupled to a similar stage. A would then be 2700/30 = 90

You will also find that beta variations make no difference to calculated values of R, and R_E but cause changes in base divider values and, of course, I, and I/P Z.

In conclusion, these are 'small' signal amplifiers and whilst they are okay for microphone amplifiers, they will severely distort a crystal pick-up output unless a series resistor of some 330k in the base signal circuit is included. Good Luck!

DEVELOPMENT OF TELECOMMUNICATIONS △ In 1945, there were 41 million telephones in the

world. The total today is 668 million — an increaof 1500 percent or seven percent per year over 40 consecutive years. As new services develop telefax, data transmission, teleconferencing and others — there are no signs yet of a slowing down of this growth.

However, it is interesting to note that three quarters of the world's telephones are located in eight countries only, and the developing countries with 70 percent of the world's population are using only seven percent of the telephones

From Telecommunication Journal — Vol 53, IV/1986 SATELLITES IN BUSINESS

△ Satellites are not only changing the face of broadcasting, they are also changing that of business. Today, major growth is occurring in the United States market for private satellite networks, and a number of satellite systems specifically designed to service the telecommunication requirements of business have been developed.

Annual sales of private satellite network earth stations are now estimated at US\$315 million. Private satellite networks offer business voice, facsimile,

and audio and video teleconferencing services.

From Telecommunication Journal — Vol 53, IV/86

CHIP PERFORMS UP TO 48 MILLION OPERATIONS PER SECOND

Philips is launching a 2 µm, single-chip, CMOS Digital Signal Processor (DSP) capable of eight million instructions per second (8 MIPS) and up to six concurrent operations in each instruction — an equivalent total of 48 million operations per second

second.
The high throughput of the PCB5010 results from a highly parallel, pipe-lined Harvard architecture consisting of two 16 bit data buses and five functional sections all working in parallel. The new DSP offers a short instruction cycle time of 125 ns.

from Electrock Pelws, June 1986

ENERGY RATINGS Refrigerators and freezers sold in Victoria will

have to be labelled indicating their rating of power usage. The labels have from one to six stars - the more stars the more energy efficient is the

The scheme applies to refrigerators from December 1986 and freezers from March 1987.

MODIFYING THE AZDEN PCS-4000 FOR A 5/25 kHz STEP RATE

The Azden PCS-4000 is a nonular two metre transceiver but it lacks provision for a sten/scan rate of 5/25 kHz.

The Azden PCS-4000 is quite a popular two metre transceiver, allowing a good deal of control from the front panel and the micro-phone. One thing that it lacks, however, (in common with many other rigs, I hasten to add) is the provision for a step/scan rate of 5/25 kHz. as opposed to the 5/10 kHz supplied as standard.

It seems that Australia is one of the few countries in the world utilising a 25 kHz channel spacing on the two metre FM sub band, however the PCS-4000 is remarkably easy to modify in this regard. All that is required is a signal diode (1N914, etc), a bit of wire, a fine-tipped soldering iron and plenty of nationcel

Reference to the circuit diagram shows that it is simple to convert the 10 kHz rate to 25 kHz. It is simple to convert the 10 kHz rate to 25 kHz.
All that is required is a link between the "KS"
and "RS" scanning lines as well as between
"K1" and "RS" when the "STEP" button is
depressed. Refer to Figure 1 for the Truth Table. It should be mentioned at this point that despite the apparent complexity of the control panel, very few functions are "hard switched" which is to say that most functions are accomplished by scanning various control lines with suitable decoding firmware.

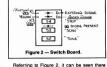
Figure 1 — "Step" Truth Table. 1 — Diode In o — Diode Out

| R5 | | | | | | | | |
|---------------------|-----|-------|-------|-----|-----|-------------|-------|----|
| Step Rate kHz | 5 | 10 | 12.5 | 15 | 20 | 25 | 40 | 50 |
| K3 K2 K1 | 000 | 0 0 1 | 0 1 0 | 1 1 | 0 0 | 1 0 1 | 1 1 0 | 1 |

CONSTRUCTION DETAILS

Remove the top and bottom covers, thus allowing the front panel to be removed. Most of the "body" is taken up with the RF section, with the microprocessor living just behind the front panel. The knobs are easily pulled off, allowing the front panel to slip off. There is a small board containing the three switches (STEP; SCAN and TONE) that can now be the interior of the rig — it is embarrassing having to turn it upside down and shake it! Besides, they can do nasty things should they happen to contact the internal battery . . .

David Horefall VK2KELL PO Box 257, Wahroonga, NSW, 2076



holes for extra diodes; currently is installed. The modification is are vacant only "D1" simplicity itself. First, insert an extra diode (1N914 or similar) in the "D2" position. It faces the same way as "D1" does.

Next, take a short length of wire from the "free" end of the diode to any "K3" point. A suitable location is on the back of the memory switch; the yellow wire is a "K3" scan-line. See the circuit diagram in Figure 3.



Beware: the yellow wire on the switchboard is not a "K3" line. Also the circuit diagram has a mistake — the line shown as "K5" on the memory switch "SW1" is actually "K3" — the one we want.

With this being done, the unit may now be tested and then reassembled. The STEP switch will now give 25 kHz stepping when depressed, resulting in much quicker bandscanning and frequency selection. It will not increment the megahertz digit when stepping. but hopefully this will be the subject of a future article

We have been unable to locate a schematic circuit for this transceiver, so we are unable to check all of the details — Tech Ed.





CORDLESS TELEPHONES

Some unapproved cordless telephones can cause harmonic interference, usually in the 3.500 MHz If you have such problems, identify the users name and telephone number by monitoring, then advise your state DOC office.

Prompt action is assured. AMATEUR RADIO, October 1986 - Page 15

DOSS DIRECT CONVERSION RECEIVED

Novice Notes

EOR FIGHTY METRES

Last month, the principles of operation of a with the promise of a construction article to follow. Following is the construction details.

DEDECRMANCE

Frequency Range: Recention Modes

CW. SSB. DSB. AM (as DSB) and RTTY. 0.4 "V for 10 dB S + N·N.

μν ιο. . ~tivity: Selectivity: 50 dB down at 100 Hz 45 dB down at 10 kHz Spurious Responses:

This is not a simple "Mickey Mouse" project but a serious attempt at a receiver of more than adequate performance. My guess is that the pected. This is because satisfactory performof components needed for a 'bare bones' DC of components needed for a "pare suries" or receiver. Sure, we could hear signals on something made up of a dual-gate FET product detector, a one- transistor VFO and a high gain audio amplifier. Unfortunately, such a receiver made receivers like this, and they always prove disappointing. Strong signals 'swamp' smaller ones, the VFO pulls (varies in frequency) on strong signals, selectivity is poor, and hum can

he a problem where mains wiring is nearby. This project is based upon the receiver I described in Amateur Radio for March '84 As only one band is required in this instance, the design is greatly simplified by the omission of the frequency divider hoard. The audio hoard is used again here without change. In addition. factory-made printed wiring boards (PWBs) are available for this project offering an added incentive to would be constructors

CIRCUIT

To prevent overload, only the band of interest; 3.5 \(\times 2.7 \) MHz, should be presented to the input of the RE amplifier. L1 and L2, tuned by C1 and C3 form a top-coupled empirically designed band pass filter. An RF gain control R1 (an attenuator really) is provided so that overly powerful signals may be reduced to an

acceptable level The broadhand RE amplifier at O1 is a nonular favourite. This amplifier is a 'strong one, with feedback and a hefty small-signal transistor (2N3053 or 2N5109, etc), not easily overloaded by strong signals. Such an amplifier would still be operating linearly long after a linearity. About 10 dB of gain is provided. Noise performance is not particularly good, but on 80 in practice obscure any noise contributed by

The active product detector is also a favourite. It is singly balanced, in that the input signal is applied to the differential input in push-pull at pins 1 and 5 of U1, a CA3028 current sourced differential pair, and VFO energy, at or near the frequency of the incoming signal is applied to the base of the current source transistor of U1 at nin 2. The sum and difference products are available at pins 6 and 8. R12 and R13 provide a balanced load, across which the difference frequency (audio) is established. The sum

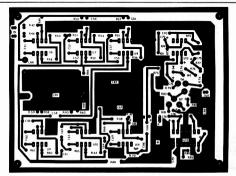
Drew Diamond VK3XII Lot 2 Gatters Road Woods Park Vis 395

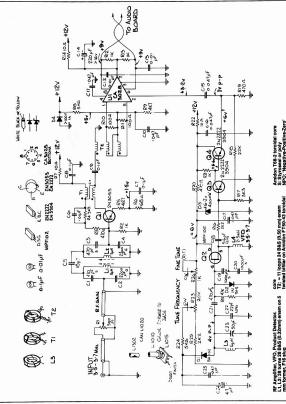
products: about 7 MHz, are suppressed by C12

and C13.

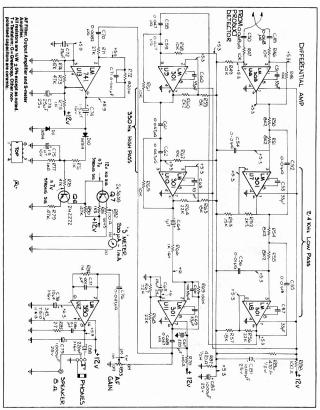
A Coloitte occillator VEO at O3 tunes from 25 to 37 MHz As variable capacitors are 3.5 to 3.7 MHz. As variable capacitors are becoming increasingly difficult to obtain, a common varicap diode, type BA102 at D1 is employed to vary the VFO frequency. The employed to vary the VFO frequency. The required capacitance variation, about 60 pF is affected by R23 (course, or main tuning) and R26 (fline or RIT). SG R23 yields about 200 kHz variation, and R26 about 4 kHz. A buffer amplifier at Q3/Q4 supplies about one volt p-p to U1, and isolates the oscillator from any load variations from the product detector reducing any frequency guilling effects from

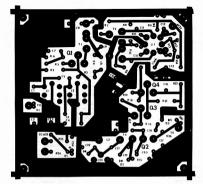
The component designations on the audio board derive from the '84 receiver. U6 functions as an interface between the differential output of the detector and the single ended input of the audio filter It is at the same time a low impedance source for the input RC network at the input of U7. Detected signals are first applied to a 2.4 kHz low pass filter to remove all unwanted higher frequency products. The LPF ation at 10 kHz of 45 dR. This filter is followed hu a fourth order 350 kHz high pass filter to by a fourth order 350 kHz high pass titler to remove unwanted lower frequency products. The HPF section has an attenuation of 50 dB at 100 Hz, so it is possible to resolve SSB, DSB. AM and CW signals with ease, because all redundant low frequencies are removed by the HPF. Power line related noise (50, 100, 150 Hz, etc) is also greatly attenuated. By backing a LPF against a HPF in this manner, a band pass filter is formed. Ringing is not a problem, as each section of the filter is independent of the





core L3: 32 turns 22 B&S (0.64 mm) enam on





others. R86/R87, bypassed by C81/C82 provide a center reference to the plus and minus control reference to the plus and minus the BFF is followed by an LM301 at U11 with me and-range plan of about 40 db, followed by an LM301 at U11 with me and the second of the control reference to the control r

CONSTRUCTION

All components are accommodated upon two PWBs; one for the RF ampproduct detector/ VFO, and another for the audio BPFfaudio AmppG-meter amp My receiver is assembled in a case measuring 255 x77 x 155 (WHD) with a case measuring 255 x 77 x 155 (WHD) with a case measuring 155 x 77 x 155 (WHD) with a case measuring 155 x 157 x 155 (WHD) with a case with a case with a case with a single purpose of the case with a single purpose of the case with a ball handle, included for things like counters. The PWBs could be mounted back-to-back. The performance of the case of the c

expensive nowever. The power supply should not be built into the receiver. As can be imagined, with all that audio gain in there, to incorporate a mains power supply is asking for trouble. A suggested circuit is presented here a a guide. Information on power supplies abounds in technical literature, and need not be repeated here. The receiver will work quite happily from 9 volts to about 15 volts. and draws about 100 mA.

about 15 volts, and draws about 100 mA.
The speaker may be placed inside the case
along with the receiver, but spurious resonances and rattles could be a problem. An
external speaker gives a much cleaner sound,
and this is strongly recommended.

Some sort of readout for frequency will have to be provided. In the past, we would simply have bought one of those Jabel or Eddystone dials, but now mechanical dials have become

horribly expensive and difficult to obtain. This was another factor which indicated the varicap and pot scheme. By using a pot for the tune control, we now get 270 degrees of rotation for ur 200 kHz, against only 180 degrees for a variable capacitor. Let me indicate the perceived dial options:

Two pots, the course pot fitted with a commonly available knob calibrated 0-10, and a lookup table or graph, as in the photograph.
A 20k, 10-turn pot for R23 fitted with a turns counting dial and a table. This is a costly

 Substitute a capacitor for D1, etc. A 100 pF variable in series with a 150 pF styroseal would be fine. If you have a nice capacitor/drive tucked away somewhere, then this could be just the time to hunt it out.

Frequency counter. If you want a really classy readout, you could incorporate a frequency counter for the display. It must be well shielded of course. Sufficient signal level exists at the emitter of Q4 for this. Partic Season bases

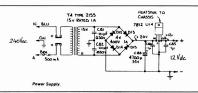
at the emitter of Q4 for this. Radio Spares have a 4-¼ digit counter module; P/N 258-D63 for about \$75 if you are keen. Alternatively, if you already have a counter, simply extend the VFO signal to a panel mounted coaxial socket for the counter connection. Take care that there is not excessive kick-back noise from the counter input.

The boards may be assembled and tested in

stages. First perhaps, could be the audio board. If the S-meter is not required, all the components associated with this feature may be omitted; ie C70 through to R81. LM741s may be substituted for the 308 and 301s, but they are slightly noisier however. The 33 pF gain compensation capacitors must be left out if component locations/polarities checked; 12 volts may be applied. With the AF gain pot fully CW, a small amount of hiss should be heard. A screwdriver blade touched to either input at C49 or C50 should produce an audible buzz. If you want to test this board more fully, a small 2k:2k transformer (not critical) must be interposed between the balanced input and an unbalanced audio oscillator. Remember, the input is balanced, so any serious imbalance could cause the amplifier to oscillate. Now the VFO, product detector and RF am board may be assembled. Winding L1 and L2 could be a bit tricky if you have not wound small coils before. First, glue the L1010 formers to the L1015 bases. About 650 mm of 28 B&S enamel wire will be required for each coil.
Solder the base end start of the coil into the pin corresponding to the earthy end of the coil the wire in a vice. Screw the F16 slug about half-way into the top of the former. Keeping the wire taut; wind on 28 turns. You will find that the slug will now provide a convenient temporary tying off point for the end of the coil. Wind a good number of turns onto the slug so

that they do not lose their tension. The coil





such as nail polish, varnish or shellac to hold the turns in place. When dry, the top end finish may be soldered to the other pin.

T2 is made as follows: Firstly, the Amidon cores must be coated with some lacquer such as mentioned earlier. This will reduce the possibility of shorts occurring should the wire enamel be scratched during the winding process. Take three 300 mm lengths of 24 B&S enamel wire. Lay them parallel to each other, and twist them together at one end. Clamp this end in a vice. Draw a cloth through the wires to remove any wrinkles. Now twist the free ends together and fix them in the chuck of a hand drill. Whilst keeping the wires taut; turn the drill until there are about three twists per cm. Give the drill a tug to set the twists, then remove the twisted group. Carefully thread the triplet onto your core until there are about 11 loops. Leave about two cm of wire at each end. Remove about one cm of enamel from each wire. With a multimeter set to ohms: locate the 'primary' winding (the one connected to C9). This gets two wires out of the locate its opposite end. Do the same with the third winding. Now connect the start of the second winding to the end of the third winding as a pad for each has been provided on the PWB.

T1 is made in a similar manner to T2, but without the primary winding. It is essential that the end of one winding is connected to the start of the other winding to form the centre tap ct.

Winding starts are indicated schematically with a dot.

In the interest of frequency stability, styroseal or polystyrene and NPC capacitors must be used where specified. Ordinary ceramic capacitors have a lower Q, and a very poor capacitance versus temperature characteristic.

ALIGNMENT The VFO frequency must first be set. Three

methods are available.

Connect a frequency counter to the VFO output. Set R26 to mid-range, R23 CCW. Now adjust C23 so that about 3495 kHz is generated. Rotate R23 CW. The frequency should rise to about 3700 kHz. Check operation of R26; it should give about ±3 kHz.

operation of R26; it should give about ±3 kHz of adjustment.

• Apply 3495 kHz from a signal generator to the input of the receiver. Set R26 mid-range, R23 CCW. Now adjust C23 until the signal is heard (the signal each part of the signal operator may have to be set

to about 50 μ V).

Note Hook about 30 cm of wire (eg a clip lead) to the VFO output to act as a radiator. Set another nearby receiver to 3495 kHz. Set R26 midrange, R23 CCW. Now adjust C23 until the VFO is heard on the other receiver.

If, for some reason, the VFO cannot be brought onto the correct frequency; the value of C22 may be altered. A 47 pF NPO would lower the frequency, removing C22 would raise it.

equency, removing C22 would raise it.
With the tuning range now established, we

can now adjust L1/L2. Connect an antenna to the receiver input. Set It o minimum attenuation. Set the receive frequency to about 3.6 MHz and peak L1/L2 for maximum signal strengths. This should occur with the slugs well down into the coils.

down into the colls.

The S-metier sensitivity pot, R82, may be adjusted when the receiver is up and going, it should be set so that the meter responds to reasonably weak signals, but at the same time does not pin violently when a strong station s tuned in.

TROUBLESHOOTING

Some key voltages are indicated on the circuit as a guide to troubleshooting should this benecessary. A high impedance volt-meter; eg DVM, must be used around the op-amps, otherwise errors will occur. A voltage which deviates by more than perhaps 10 percent from that shown would indicate a fault in that area.

and shown would indicate a fault in that area.

An effect that had me puzzled for some time at An effect that had me puzzled for some time a howl from the speaker as the AF gain control approached maximum. After checking for faulty by-pass capacitors, sources of imbalance and so on, suspicion fell upon the CA3026. Touching my soldering iron onto the can made the oscillation increase, whitst cooling it with CA3028 was indeed unbalanced. Replacing this IC cured the problem.

Please, if after fruitless attempts on your part you cannot locate a problem, write to me about it and I shall extend any reasonable amount of help necessary.

PARTS

Care has been taken to select parts which are, to my knowledge, readily obtainable. The only components which may be difficult for some are the toroids and the CA3028. These are available from lan J Trascott's Electronic World, whose address is given below. The component parts of L1/L2 and the signal meter are available from Dick Smith Electronics. If you prefer to buy all your components from one source, a kit is available for other.

Complete kit of parts, including PWBs: \$95.00
Just 'Bare-Bones' — PWBs, toroids, all semiconductors: \$52.00
Case (as in photograph): \$15.70
(All prices include postage.

SUPPLIER lan J Truscott's Electronic World, 30 Lacey Street, Croydon, Vic. 3136.

REFERENCES AND FURTHER READING

1. Solid State Design for the Radio Amateur - ARRL

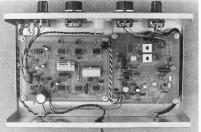
2. Practical RF Design Manual - DeMaw

3. High Performance DC Receiver - Diamond, VXSXV, AR March 34

4. The Design of Active Filters with Experiments - H

6. Direct Conversion CW Transceivers - Price

64BWE, Rad Comm, Jan 36



PARTS LIST RF Amplifier/Product Detector/VFO Board

CAPACITORS WHERE USED

5.6 pF. > 25V, NPO disc ceramic

18 pF. > 55V, NPO disc ceramic

22 pF. > 25V, NPO disc ceramic

50 or 60 pF trimming

C23

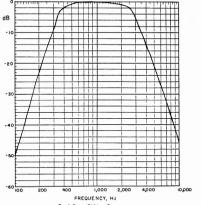
 capacitor
 C1, C3, C21

 470 pF Styroseal/ Polystyrene
 C1, C3, C21

 1000 pF Styroseal/ Polystyrene
 C19, C20

 2000 pF Greencap/ 2200 pF Greencap/
 C2, C4

Polyester 0.01 μF, > 25V, disc C6, C12, C13 ceramic



Band Pass Filter Resnonse

T68.2

C10 C11 C15 C16

C17, C25

ceramic C17, C25 0.1 μF, > 25V, disc ceramic C7, C8, C9 4.7 μF, > 16V, tag tantalum C24 220 μF, > 16V, PC mount C14 RESISTORS WHERE USED 4.7 ohm. ¼W. 5% 10 ohm, ¼W, 5% 68 ohm, ¼W, 5% R7 R14 R22 R6 100 ohm. ¼ W. 5% R10 R11 470 ohm, 1/4 W. 5% R3, R19, R20 1 kohm. ¼ W. 5% R2. R12. R13. R21 2.2 kohm, ¼W, 5% R16, R25 3.3 kohm, ¼ W, 5% R4 R17 4.7 kohm, ¼W, 5% BO

R8, R24 5.6 kohm, ¼W, 5% 22 kohm, ¼W, 5% R18 47 kohm, ¼W, 5% 500 ohm linear (A) pot, 1/4" R1 chaft 1 kohm linear (A) not 1/4" R26

20 kohm linear (A) pot, 1/4" shaft B23 SEMICONDUCTORS

0.047 "F > 25V disc

ceramic

2N3053/2N5109 2N2222/2N3904 MPF102/MPF103 CA3028A BA102 1N914/1N4148 6.2V, 400 mW zener

> 100V, 1A diode

WHERE USED Q3, Q4 02 U1 D4

WOUND COMPONENTS Former: 5 mm: DS P/N L1, L2 1 1010 Slug; F16; DS P/N L1302 1112 Base: DS P/N L1015 L1, L2 Can: DS P/N L1020 L1, L2 Toroidal Core: Amidon

BE Choke: 2.5 mH, DS P/NI 4 L1824 Toroidal Core; Amidon ET60.43 1m #22 B&S (0.64 mm) L3 enam wir

2m #24 B&S (0.5 mm) T1, T2 enam wire 2m #28 B&S (0.32 mm) enam wire Audio Board CAPACITORS

33 pF > 25V disc ceramic C51, C53, C57, C60. 0.001 nF (1000 pF) > 25V disc ceramic 0.0033 µF > 25V disc C66 ceramic

0.0082 µF Greencap 0.01 µF Greencap 0.047 µF Greencap C70 C52, C54, C55, C56 C58, C59, C61, C62, C68, C76 C49, C50 0.068 μF Greencap 0.1 μF > 25V disc ceramic C80 1 μF > 16V tantalum C64 1.5 μF > 16V tantalum C74

10 μF > 16V tantalum

C64 C74, C75 C78

25 "F for 22 "F) PC mount C65 C72 C73 electrolytic

220 uF > 16V electrolytic C67. C88 220 μF > 16V electrolytic 1000 μF 25V electrolytic 1000 μF 25V PC mount electrolytic RESISTORS

2.7 ohm 1/4W 50/6 2.7 OHHI 94 VV 590 D70 D00 100 onm www.on H/0 R86 R87 470 ohm 14W 596 1 kohm 1/4W 504 R66 R75 R76 1.5 kohm 1/4 W 50/ D81 2.2 kohm ¼W 5% R52 R60 2.2 KOHIII 74 VV 570 R50, R51, R54, R55 R46, R47, R48 40 kohm 14 W 506 R49 R58 R61 R62

H65 B53 B50 15 kohm 1/4 W 596 19 kohm 1/1M 58/ P57 R63 22 kohm 1/4W 5% R56, R64, R67, R68 22 KOHM 14 W 5% 971 47 kohm 1/4 W 5% R73 R74 R78 R79 DAO 100 kohm ¼W 5% Dec

R65

R72

820 kohm ¼W 5% B77 B84 1 Mohm C taner not **B83** SEMICONDUCTORS 1N914/1N414R D10 D11 2N2222/2N3904 2N3638

06 LMADO 116 LM301 U7. U8. U9. U10. 1111 LM741 U13 I M380 Hardware

Case, 255 x 77 x 155, large knobs; one calibrated 0-10 (2 required), small knobs (2 required), signal meter; 250 µA; DS P/N Q2100, input connector, headphone socket, speaker socket, screws (8 required), nuts (8 required) spacers (8 required), hook-up wire, small 50 ohm coaxial cable (300 mm), (Speaker; not supplied in kit)

GWSCO

"Two of your QRP friends to see you, dear . . ."

—Cartoon courtesy The Short Wave Magazine, March
1986



DOLLAR DECLINE — What it means

Jim Linton VK3PC 4 Ansett Crescent, Forest Hill, Vic. 3131

A look at the dramatic drop in the value of Australia's dollar. and its impact on amateur radio. Some of the people in the industry, which imports or makes equipment for radio amateurs and other communications/electronics enthusiasts, have been interviewed and their thoughts on the current economic situation give an up-to-date insight into the industry.

The newspaper headlines say it all — the bottom has fallen out of Australia's dollar on the foreign exchange markets. This has come about because, internationally, our dollar has been devalued, due to this country's balance of trade situation, rate of inflation, unemployment, level of overseas debts and other economic factors.

Most amateur radio equipment is imported from lapan and the dollar has taken a nosedive against Japan and the dollar has taken a nosedive against the Japanese Yen, which is currently one of the world's strongest currencies. About 12 months ago, currency exchange was 160 Yen to the Australian dollar, but the exchange is now in the low 90s — a decline since January of about 35 percent.

A typical Japanese transceiver costing about \$399 12 months ago, now sells for \$649, a 60 percent increase, and industry sources predict further price increases.

The pricing structure which determines the retail price of equipment is too detailed to be fully explained in this article, however, there is a price chain before the consumer. This starts with the chain before the consumer. This sales with price of equipment in Japan, the freight to Australia, Customs Duty and Sales Tax. The retailer adds a mark-up to cover overheads — the level of which depends on various factors including competition in the marketplace and what the

market can stand.

With landed prices so high, and rising because of the exchange problem profits are low and some retailers, who find themselves out of stock, are receivers, wito miss intermenters out of stock, are often unable to quote a firm price to the buyer. This is due to the unknown fortunes of the Australian dollar or whether there is a price rise just hours away.

DICK SMITH ELECTRONICS

The high price of new equipment is seeing a rival in home-building. Dick Smith Electronics (DSE) is one to move in and provide kits aimed at radio communication enthusiasts. DSE General Man-ager for Technical Products, Garry Crapo VK2YBX, says the situation "forces people back

to building equipment."

The Company has produced a large number of kits over the past few years. There has been a string of 18 DSE kits including the VHF Com-mander transceiver, UHF Explorer transceiver, a HF transceiver, power meter kits for VHF and UHF a direction finder, 100 watt linear amplifier, 13.8 volt 15 amp DC power supply preamplifiers, computer interfaces, frequency counters and antenna kits. Next will be a packet radio kit, combining the computers with amateur radio. Considerable savings can be made by the con-

Considerable savings can be made by the con-sumers constructing their own equipment. DSE have evolved kits which require only a screwdriver and soldering iron. Garry says he is committed to seeing that kits are developed to meet the needs of enthusiasts. He says: "It's not a matter of saving money but of getting back to home-braudier!"

home-brewing."

He says this activity as far as amateur radio is concerned can be considered as a service rather than a business activity, at least during the present economic climate.

AMATEUR RADIO MAGAZINE KIT **PROJECTS**

Another success with kits has been the 80 metre transmitter by Drew Diamond VK3XU. The same is expected for the 3.5-3.7 MHz 80 metre direct conversion receiver described elsewhere in this magazine. These kits are available from lan J Truscott's Electronic World.

The technician with this retailer, Ron Van Bremen says Drew approached Truscotts to see if Bremen says Drew approached iruscotts to see if they were interested in sourcing his transmitter kit and marketing it. The exercise has been success-ful so far with in excess of 50 kits being sold and mail order inquiries still arriving. Mr Van Bremen says: "If the transmitter kit is any indication the preplicar kit should take of

Mr Van Bremen says: "If the transmitter kit is any indication the receiver kit should take-off. "The good thing about the transmitter kit is that you can get on the air with a few watts for about \$25, if you provide your own case. The receiver kit is more complex and will be slightly dearer in

BAIL ELECTRONIC SERVICES

Bail Electronic Services has been an author agent for Yaesu equipment since 1963. company spearheaded the importation Japanese transceivers and other communications equipment into Australia and was successfully run

by the Ball brothers, Fred and Jim, until 1979. Known as "Bails," it was sold to Stan Roberts VK3BSR, after the death of Fred Bail.

Stan, a radio amateur for 38 years, has spent all his life in communications, including being a PMG

his life in communications, including being a PMG engineer. He runs the importing and servicing business from Wangsartat in north-east Victoria. business from Wangsartat in north-east Victoria. business from Wangsartat in north-east Victoria. Says: "It's virtually doubled the price of equipment over the past 18 months. It's obviously had an effect — (don't know what I should order because the says. The wangsartat was supported to the past 18 months. It's obviously had an effect — (don't know what I should order because days and the says of the says of

iteur can afford that sort of money?

The downturn has forced him to retrench one technician in August Stan says what should concern people is, if the likes of Bail Electronic Services disappears from the amateur scene it will leave a hole in the

availability of equipment maintenance.

Balls can be likened to the now extinct corner grocery store, where service and advice were paramount — totally different to the modern supermarket merchandising approach. Bails has a good reputation throughout Aus-

tralia and customers, both amateur and comme cial, ship their equipment for service from all corners of the country

EMTRONICS

he dollar crisis has meant an expansion of its manufacturing section for Emtronics, whilst still maintaining its import and retailing activities. Company Director, Elizabeth Breznik, says she

cannot predict anything but a further deterioration in the exchange rate for a short time to come. Despite the economy, she says the family business has had a "climbing upward trend in turnover — we've actually done better this year than last — close to a 30 percent increased turnover."

Elizabeth says: "The only way to do that is to work as a family — to give more than take — and if everyone in Australia did that things would im-

This astute business woman is well aware of the Federal Government's current drive to boost Australia's exports and "Buy Australian" campaign because of the country's poor balance of trade situation. Perhaps Emtronics will catch this wave of patriotism which is likely to include some overnment assistance for those wanting to put Australian products into overseas markets.

Husband Rudi VK2AOT, also a Director, ex-

plains that Emtronics is making about nine prod-ucts, aimed firstly at the Australian market, but with an eye on exports - including into the Japanese market. These products include an antenna tuner and a cross-needle SWR/Power meter with built-in dummy load.

Rudi's found that when importing this equipment it is too expensive and people won't buy it. A popular imported cross-needle SWR meter now costs about \$250 retail in Australia

Emtronics are starting to make beam antennas and are gearing up for mass production with the aim of exporting most of them to Japan Other equipment manufactured by the company include linear amplifiers and regulated DC power supplies. It has already received inquiries from

overseas for this equipment. After business hours, Rudi is concentrating on roduct design and is convinced there is no need to have a factory to produce equipment. He says that during his buying visits to Japan for the company, he has had a good look at how ronic goods are made in that country. He is now training and sub-contracting people to mimic the "Japanese kitchen industry where subcontractors get paid for every piece - that is the

only way we can compete."

To strictly maintain quality control, every item from the subcontractor will be tested in Emtronics workshops before being sold.

ICOM

Kyoshi Fukushima VK3BZX, Managing Director of lcom Australia, says that, while there is a depressed market for amateur radio equipment, the company has maintained its prices structure since January, as radio amateurs cannot afford the higher prices.

Icom Australia has been operating for about four years and is owned by Icom Incorporated of Japan. Kyoshi says Icom equipment in Australia sells at retail prices "even lower than in Japan."

He says: "We want to keep the price as low as we can — and compete with more features in our equipment. Consumers can shop around and look for quality - it's not only price, but a quality product with more features

"loom engineering people are putting a lot of care and effort into keeping costs low — designing with more components to make simple, reliable and better performing equipment in many aspects

Icom Australia has supported its amateur radio equipment prices through the sale of marine and land mobile equipment, but obviously prices will have to rise in the near future.

KENWOOD

Kenwood Australia, owned by the Trio-Kenwood Corporation of Japan, is in a similar position. National Sales Manager, Sandy Bruce-Smith VK2AD says Kenwood's turnover has increased dramatically since it stabilised the price of amateur radio equipment since January.

Sandy says: "We're riding it as long as we can,

but we have to remain profitable. He cites prices in Australia as being very competitive with those in Japan. For example, to buy one TS-440 transceiver in Japan and bring it into Australia would cost \$1800-\$1900. This unit is available in Australia through Kenwood for \$1585.

KCC

KCC is a Sydney-based company run by Kay Bruce-Smith, Sandy's wife, and is making inroads into ancillary communications equipment such as dip meters, noise bridges, receiving antenna tuners and line filters. iners and line tilters.

Kay says the company, which started four years

ago, is exporting mainly to the South Pacific. The components — a variable capacitor and two She says: "Radio amateurs are realising that

decent equipment can be made in Australia But to produce equipment with intricate moulding and complexity requires a high turnover — so the Japanese, already tooled up for this, will continue their hold on the electronics market.

Commemorative Transmission Marks A CLIMBING OF MOUNT **EVEREST IN THE ELECTRONICS FIELD**

Jim Linton VK3PC 4 Ansett Crescent, Forest Hill, Vic. 3131

The 80th anniversary of Australia's first land wireless broadcast was commemorated by radio

amateurs in Victoria and Tasmania.

At 1 pm on July 12, 1906, the first message was transmitted by wireless telegraphy between Queenscliff, Victoria, and Devonport, Tasmania. This was a communication milestone which bridged Bass Strait to link Tasmania with the and

Exactly 80-years later, Alf Forster VK3AJF and Russell Walker VK3CM, of the Geelong Amateur Radio Club (GARC) huddled in a tent at Golightly Park to communicate with Jim Davis VK7OW, a former WIA north-west branch historian, at Devenoort

It took the GARC team about 60 minutes to s up their station for the prearranged sched on 3.610 MHz. Russell said the anniversary was mentioned at a GARC general meeting and most local radio amateurs were not aware of the historic exper-iments carried out by the Marconi Company in their local area. He said the site, which was now a football oval, there is a granite cairn which gives details of the first communication in 1906, and lists those who were present. The timber building, used then, has been removed and is now in a state of disrepair on a nearby farm.

During the commemorative transi read an old newspaper report which said that greetings were exchanged between the Governor General of Australia and the Governor of Tasmania. He had taken a keen historical interest in the first transmission and explained how the



Alf VK3AJF (left) and Russell VK3CM, in contact with Jim VK7OW, for a commemorative transmission to mark the 80th anniversary of Australia's first land wireless broadcast.

Photograph courtesy The Geelong Advertiser

occasion resulted in a half-day public holiday.
"Bookmakers took bets that the signal would not come through," Jim said

There is a carn at East Devonport to mark the historic spot, and Jim has pictures of the building used for the transmission.

The Marconi Company wanted to sell wireless equipment to the Australian Government and sent engineers to Queenscliff and Devonport to conduct the experiment.
Russell said: "The Marconi Company showed

. част зака: - re Marconi Company showed great initiative to spend money and come out to do the experiments. 'It was, of course, a commercial exercise — I

think they knew it would work and it wasn't so much an experiment."

He had read up on the event and talked to others about the type of spark equipment and size of antennas used for the transmission. "It was really the pioneering days — a climbing of Mount

Everest in the electronics field. Experts travelling from the United Kingdom to "Experts travelling from the United Kingdom to set up the massive antennas and complex equip-ment would have cost hundreds of pounds," Russell said. Taking part in the commemorative event made him feel a bond with the wireless pioneers. He felt an increased awareness of the

difficulties they had, not only technically, but in convincing others that wireless telegraphy would He said:"Commemorating the transmission was a worthwhile experience and helped make young people aware of the pioneering days."

After the initial commemorative transmission contact, about 18 other stations joined the event.
The WIA 75th Anniversary had stirred many into thinking about the history of our hobby and radio communication. But the 80th anniversary crept up

on the GARC, leaving the club with little preparation time Russell said he hoped the century of the first land wireless broadcast on July 12, 2006, was "a truer re-enactment" with the involvement of digni-

taries. "It would be good to have dignitaries involved — it could make the whole thing more important to the general public."
The 38-year-old said he would like to be at the

century commemoration, but considered younger radio amateurs of that time should run the show so they can feel the same bond with the pioneering spirit and carry on the tradition.



Australian



UP. UP AND AWAY!

JAS-1 was launched on August 12, 1986 at 2045 UTC from Tanega- shima Island, along with two

other satellites JAS-1 was heard on its first orbit over Australi duration was 120 minutes, typical fast time 20-25

amateurs communications using voice on the first day of

Field Aligned Irregularity (FAI)

This article originates from HB9QQ and was published in Electron June 1986. It was translated for AR by John Aarsse VK4QA. (Electron is the official journal of

During the last few years, various publications have hinted the probable existence f new, and until now, little known or unknown propagation modes on two metres.

As the title indicates, it will deal with a omenon caused by the irregularities in the This article will attempt to steer these unknow

but very interesting propagation modes into practical realities. It is possible that interested amateurs will be

able, with minor modifications to their equipment, to make FAI-DX QSQs on 144 MHz. The following information will make it possible for amateurs to recognise the phenomenon and thus be able to conduct a reasonable DX QSO.

PHYSICS BACKGROUND

FAI contacts use a special type of reflecting or bending medium, similar to Sporadic E contacts. The difference is that the medium can be imagined not to be a flat surface, but more as a snake-like pattern along the magnetic force lines. Experience so far indicates beyond doubt that

Experience so air indicates beyond doout real. AFI is concurrent with a given Es situation. The propagation mechanism can be imagined as an ionisation along the magnetic field lines about 100 kilometres above the earth. The 14 MHz signals are transmitted into the FAI zone and then are "bounced-off" in a very particular angle to the field lines. This area is known as the

scattering area Further, it is known that FAI contacts in southern Europe (equal to approximately south Queensland/northern New South Wales) are more prevalent than in northern Europe. As these phenomena are quite complex, no further discussion is possible within the scope of this

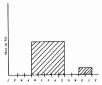


Figure 1 - FAI possibilities during the year. FAI OPENINGS

As stated earlier, FAI openings are usually possible whenever there are Es possibilities Figure 1 shows during which seasons it is possible to encounter FAI contacts in the Northern Hemisphere. A similarity with the Es season is evident. But FAI contacts are possible when there are no Es possibilities. Further, FAI contacts were observed after an Es opening. Because of the fact that so far very few reports have come in about FAI openings, it is not yet possible to give reasonably accurate predictions as to which season is the best. Indications are that

May until the end of September appear to be the most productive in the Northern Hemisphere. Smaller possibilities in December and January have also been observed. But it is clear that FAI contacts should be possible when no Es is recognisable on 144 MHz.

TIME OF FAI

Nearly all known FAI contacts were made between approximately 1700 and 2400 UTC, with a maximum between 2000 and 2400 UTC. (See



Figure 2 — FAI possibilities time-wise. CHECKS

To have probable FAI possibilities, Sporadic E propagation should be possible, for instance on 50 MHz. To check for Sporadic E, the following procedures are possible:

check the 28 MHz band
 check the television channels (48-54 MHz)
 check the east European 70 MHz broadcast

If, for instance, strong 28 MHz signals are coming from Rumania (YO), one can assume that the FAI "incoming" area is in locator JN 66 (approximately Longitude 12.8 degrees east, Latitude 46.5

degrees north).

If 28 MHz signals are audible from the Crimea,
KN 75 (approximately Longitude 34.8 degrees
east, Latitude 45.56 degrees north) and one also
hears the 70 MHz broadcasts, then one can
assume that the FAI entry is around JN 97 (near pest). Here again, the positional longitude atitude of the FAI zone can be decided. In any case, both stations must direct the signals toward the FAI zone and not towards the other station. Further, it should be noted that the reflection is not linear, but follows a half-circle path south of the FAI zone. This small zone is shown by the broken



Figure 3 - FAI Zone Format. The same illustration shows that with a fixed

The same illustration shows that with a fixed antenna direction of 54 degrees the following contacts are possible: ON, Central Germany, West Poland, UC and UA. It must be understood that the FAI zone position can shift and thus the FFAI zone seems to be understood that the FAI zone seems to be understood that the FAI zone seems to see that the TAI propagation is completely different to Expropagation. The most important question is how one has to determine the antenna position in elevation and azimuth.

This information can be evaluated by pinpointing the FAI zone as exactly as possible

This position can then be fed into a computer an the angle can then be shown graphically. (See Figures 3, 4 and 5).



Figure 4 — FAI scatter at 47.5N and 22E (locator KN07XN). Transmitting station located along line +11 and QSO possibilities with stations along line -11. Azimuth 084



Figure 5 — FAI Scatter at 55N and 6E, locator JO35AA. Transmitting station along line -21 Possibilities with stations along line +21 (GM, OZ, UG).

TECHNIQUES Experiences so far indicate that a minimal station

concept is necessary to achieve representative results. Very important is a relative large anti system to accurately determine the position of the FAI zone. An excellent array would be a 4 x 11 stacked array. Further, it is essential that the elevation is adjustable. Nearly all the usual receiver preamplifiers are good enough to get a reasonable sensitivity, while about 250 watts on the transmitter side should be sufficient.

OPERATIONS

Usually, FAI signals are very weak and often have a typical sound in the form of flutter or noise, similar to Aurora signals but not as deeply modulated. Because of these problems, most FAI contacts are made on CW. The difference between FAI and Es signals is that FAI signals are usually very weak but are more constant than Es

CONTACT PROCEDURES

It is beyond doubt that FAI is a very interesting propagation mode. The reason why FAI contacts are not too successful up until now is probably due to the lack of specialist experiments in these areas. Also, there is hardly any communication and co-ordination between those interested in FAI in Europe. As a result of this article it is hoped that FAI becomes better known and a start can be made to systematically research FAI as follow

 a) As from April this year, a start was made of systematic tests in certain areas; eg G, EA, F, DL, J. HB, YU, HG, YO, LZ.

Any predictions of FAI propagation will be announced on any of these frequencies: 28.885, 14.345, 3.645 and 144.470 MHz.

 b) The proposed times to test FAI openings are suggested to be on the full hour (h+00) and halfhour (h+30), the reason being that it will be impossible to search for a whole hour with the utmost of concentration for very weak signals. C) For instance, FAI tests can take place on CW between 144.025 and 144.035 MHz and on SSB between 144.150 and 144.160 MHz. The reason for this selection is, that between 144.025 and 144.035 MHz, which is adjacent to the EME

segment, hardly any CW traffic occurs. A segment

of maximum 10 kHz width should make it easier to search for active FAI stations.

search for active PAI stations.
d) FAI CQ calling is proposed to be done thus:
... CQF CQF CQF de HB9QQ, HB9QQ ... The reason for this method is that it will make it clear that it is a FAI test CQ. This procedure is also used with Aurora tests, CQA has been used very successfully

e) FAI reports to contain the following information: ... de HB9QQ RPRT 54F QTF 080 EL 12... A report indicated with the letter F ensures that

the other station realises the FAI mode of important for final correlation of good FAI zones.

REPORTING FAI CONTACTS

All reports and results of experiences with FAI should be sent to a central point. How this is to be regulated is presently very vague. It is proposed that, initially, national organisations collect the data until such time as a permanent IARU Region 1 co-ordinator is appointed.

CONCLUSION

This article has been presented in the interest of serious experimenters and researchers. It does not profess to be complete and/or totally correct. Anyone genuinely interested in FAI is asked to contact Prierre Passeur H990Q. Sunnhaldonst? A. C.H-600 Dusbendorf, who, while writing this asked to contact Prierre Passeur H990Q. Sunnhaldonst? appreciation approach to the contact Prierre Passeur H990Q. Sunnhaldonst? A. C.H-600 Dusbendorf, who, while writing this asked to the contact Prierre Passeur Pa



NEW RADIO BAND

Commercial and private users of radio in Australia are now being offered a relatively new VHF band. The Department of Communications released the 40 MHz band last year and it is permitting

repeater stations.
Companies selling transceivers for this band claim that its ground wave propagation make it superior to the higher VHF bands in rugged and hilly terrain.

COMPUTER EDUCATION

Over the next four years the Victorian Government anticipates spending \$20 million developing computer education in state schools.

The allocation will ensure that computer technology is made available to all primary and post-primary students in Victoria. Computer education is now a major education priority as familiarity with computer technology will greatly enhance young people's future.

Power Supply for a VIC-20 Computer Keith Rehe VK4AIO

7 Guardsman Avenue, Alexander Hills, Qld.

An alternative power supply for the Vic-20 is constructed thus . . .

Being a user of a Vic-20 computer, like many

others I expect, I am having power supply trouble. My supply has always got hot but this time it stopped completely (gave up the ghost) This particular unit requires nine volts AC and five volts DC An alternative supply was constructed in the

following manner Using an old electric blanket transformer, I removed several turns from the secondary

winding to give exactly nine volts AC.

The regulator board was removed from the original Vic-20 supply and installed inside the transformer control unit.

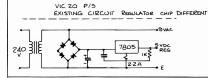
The offending component (the regulator) is encapsulated in epoxy resin and can be unsoldered and left behind. Replace the regulator with a 7805 and use a very good heat sink. Connect nine volts AC to the board and use

the existing power supply to computer lead (removed with the board from the old Vic-20 supply). Bridge the 2.2 ohm resistor and remove the 1k resistor. The constructed unit, not being enclosed in

epoxy does not get so hot and should last longer.
At least it will be easier to service in future!

No originality can be claimed for the circuit . . . just the idea!

Figure 1 - The Vic-20 Existing Power Supply Circuit (regulator chip different). Bridge is a 2.2 ohm resistor Remove the 1k resistor Use a good Heat Sink



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IT TOOK OSCAR TO INTRODUCE US to the world!

Technology in communications has advanced so rapidly that we now rarely give a second thought to live telecasts from overseas The same technology has

revolutionised radio communications and Joe Ellie VK4AGI of the Sunshine Coast Amateur Radio Club, save amateurs have spoken on their sets to people up to 39 000 kilometres away. Joe, in the following article which was nublished in NEWS PLUS, traces

advances in radio communication over the nest 30 vears.

At 10 pm in October 1957, near the village of Tyuratum, 240 kilometres north-east of the Sea of Aral, a Russian rocket blasted off into space carrying Sputnik One.

Shortly after midnight a BBC radio operator at a monitoring station near London noted an unfamiliar beep-beep-beep signal.

Max Deep-beep-beep signal. Direction-finding equipment showed the direction changing rapidly. Only one conclusion was possible, that the signal was coming from an artificial space satellite. The space had begun.
In the mid-1940s, long before this event, it was well-known that satellite relay stations could be seen that satellite relay stations. Other space techniques were already being prudently investigated at this time. Project Echo involved placing large 30 to 40 metre aluminised balloons into orbit. Project West Ford was an etternot to create an artificial reflecting band attempt to create an artificial reflecting band around the earth by injection hundreds of millions of conner needles into space It is a matter of history that the United States abandoned these efforts and followed the Russian's Soutnik a few months later with

Explorer One The radio signals from Soutaik were so loud that thousands of amateur radio operators and that thouse listeners were able to hear the spacecran. The world responded with surprise and elation, according to newspaper renorts of the

day to these wondrous events. day, to these wondrous events.

What was your reaction? I remember feeling a that I would be talking to other parts of the planet via satellite from my own home in future years!
The story of amateur radio satellite operations
began in 1959 when a group in the United States
constructed a device and managed to get a free
lift on a rocket which blasted off from Vandenberg Air Force Base late in 1961

Air Force Base late in 1961.
Orbiting satellites carrying amateur radio gave rise to the short term OSCAR. This was OSCAR One and it sent signals for 22 days before decaying and burning up in the earth's OSCAR Five is of particular interest Australians as it was designed and constructed by students at Melbourne University. The project was students at Melbourne University. The project was finalised in 1966. It had to wait four years before a free launch was negotiated on a NASA rocket in The first successful command of an amateur satellite took place on Orbit 61 of this

Australian designed unit.

Nine. Designed and built at the University of

Surrey LIK it was launched during 1991 into a low flying Polar orbit 544 kilometres above the earth It is a scientific unit sending radio propagation details and other information Russian radio amateurs have also launched their own versions. Sputniks Three to Eight were all launched together into low altitude croits and

are solar powered. The Japanese amateurs, who have assist with the construction of previous OSCA OSCADS recently launched their own satellite IAS.1 recently launched their own satellite, JAS-1.

There was excitement among the international radio operator community in 1983 when OSCAR 10 was launched via a European Space Agency rocket. A previous attempt to deploy an OSCAR 10 anded in disseter when the Ariana rocket blaw-up after launch, dumping hundreds of volunteer hours of work into the Atlantic Ocean hours of work into the Atlantic Ocean.

OSCAR 10 is operating in a high altitude

Molniya orbit. This enables us to communicate
through this device for long periods without
significant changes in the azimuth and elevation
in our antenna system.

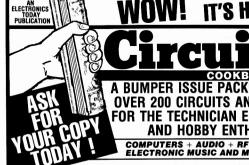
Designed for a life expectancy of seven to 10

vears, it recently became affected by solar/cosmic radiation. For the technically minded, the satellite is of tristar construction and weighed 90 kilograms at launch. President John F Kennedy said in a report to Congress in 1961: "I invite all nations to participate in a communications satellite system in

participate in a communications satellite system in the interest of world peace and closer brotherhood among the people of the world."

Some of the 16 000 amateur radio operators in Australia have taken up this challenge and are able to bypass censorship and Governments and directly communicate with other human beings on this planet, thus contributing to a more peaceful vorlid.

—Bearinted from News Plus and contributed by John Aarsse



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1986 REMEMBRANCE DAY OPENING Profile researched by: Ken McLachlan VK3AH **ADDRESS**

Tape transcribed by: Ron Fisher VK30M

Every year the Remembrance Day Contest is preceded by a short opening address on all frequencies by a notable personality.

This year, it was thought fitting that, due to the 150th Anniversary Celebrations in South Australia, a well-known South Australian should present this address. No better choice could have been made than the notable Australian. Sir Mark

Oliphant. Before presenting Sir Mark's address, a little about this great man

SIR MARK OLIPHANT Marcus Laurence Elwin Oliphant, was born in Adelaide on October 8, 1901 and was educated at the Unley and Adelaide High Schools and later at the University of Adelaide, gaining an Exhibition of Distinction to enter Cambridge University. Here

he obtained his PhD. He gained employment at the famous Cavendish Laboratory under the eminent New Zealand atomic physicist, Lord Rutherford.
At the age of 34, he became the laboratory's assistant director of research and in 1937, accepted the position of Poynting professor of physics and head of the physics department at the University of Birmingham. In 1943, his secondment by the United States of America was approved, where he was to work with American scientists that developed the atomic bomb. This gentleman was one of the team of scientists who discovered the 'deuterium reaction' that led to the development of the hydrogen bomb. During World War II he concentrated his abilities on the research of radar and atomic energy.

He has consistently opposed the use of nuclear weapons and one of his many philosophies which he quotes many times is "scientific discovery must be studied in relation to its use and misuse

by mankind. by mankind."

Sir Mark holds many degrees conferred by various universities. He has had notable employment both in Australia and overseas, some of the positions being Director of School of Research in Physical Sciences (1950-1963) and Professor of Physics of Ionised Gases at the Institute of Advanced Studies at the Australian National University (1964-1967).

Marcus Oliphant was knighted in 1959, at the age of 58, for his contributions to science. In 1971, he was appointed Governor of South Australia, a position he held for five years. His popularity in that state was overwhealming due to his being a public spirited and free-speaking

Sir Mark Oliphant, AC, KBE, FRS, thank you for your participation in the 1986 Remembrance Day Contest. THE 1986 REMEMBRANCE DAY OPENING

ADDRESS I am honoured to be asked to speak during this Remembrance Day Contest though I think that I belong to a generation which knew nothing of the techniques or achievements of radio as exists

When I was a youth, radio amateurs used spark transmitters. Morse code and crystal detectors. Such enthusiasts did not realise that they were pioneers of the solid-state electronics used by both professionals and amateurs now. I shall

mention this again later.
In the laboratories of the Department of Physics of the University of Adelaide, we used crystal receivers to listen in earphones to the local radio code messages to ships in the neighbourhood. Then just after the First World Wer, the First De trust after the First World Wer, the First De trust and the trust was the second of the second trust of trust and the trust was with one of these that I trust Nevertheless. It was with one of these that I trust Nevertheless, It was with one of these that I trust Nevertheless. It was with one of these that I trust the second trust was the second to the second trust the second trust trust was the second trust to the second trust he was the second trust to the second trust trust

atterwards the hard vacuum three electrode valves appeared.

George Fuller, my fellow honours student, invested in a complicated six valve receiver with successive, separately tuned radio frequency amplification components, which had to be tuned

amplification components, which had to be turned by turning six separate knobs.

I wondered then, and I still wonder, how anybody ever had the patience to use such a device. In those days, there was no mention whatever of radio in the lecture given in the Department of Physics.

Although the electro-magnetic theory, that is

Maxwells equation formed the backbone of part of

the course. When I left Cambridge in 1937 to become the Professor of Physics in Birmingham, the whole of the university, including the laboratories of the Physics Department, operated on direct current, which was generated in the Department of Mechanical Engineering, with reciprocating steam plant, so in the laboratories there were no experiments using alternating current and consequently, no electronics of any kind. consequently, no electronics of any kino.
An honours graduate in physics at the end of his course knew nothing of electronics. We, who were senior members of the Cavendish Laboratories, where Appleton, Radcliffe and others had done historic work on the Heaviside layer of the upper atmosphere and used electronics extensively in

their investigations, had been inducted into the secrets of radar before the war. When war broke out, we were immediately assigned to war-work in that field. This was not a simple task in my physics department, where no electronics had been taught. The shortest wave length available using the vacuum valve known as the Micro-pup was about 50 cm. This was not

suitable for air-borne radar. So I was assigned the problem of how to generate pulses of radio power with a wave length of 10 cm or less. Having visited the various manufacturers of radio valves, I decided that we needed a team of people able to think in terms of first principles, rather than the practice of radio as it was at that time. It seemed clear to me that it was essential that the resonant circuit of the oscillator for these very short wave lengths must be an integral internal part of the system rather than external to an electronic valve the size which could never be reduced greatly and still give appreciable power. So we began with a continuously evacuated klystron which produced about 600 watts of radio frequency power and gave good echoes from aircraft and ships. Doctor Sayers was the keyman in that demonstration. The receiver was a silicon crystal

which was used in a super heterodyne cir converting the radio frequency to that used for early British television, the circuitry for which was available commercially. It was the diode to which Bell Telephone Laboratories added a third electrode and the transistor was born. Meanwhile, Randell and Boot produced the concept of a ring of oscillatory circuits surrounding a cathode at the centre of a magnetic field, the so-

called cavity magnetron. He and his colleague Boot developed this to give many kilowatts of radio frequency power in pulses at a wave length After some modification by Sayers, this became the standard technique in late wartime radar it is ironic perhaps, that the greater use of the

magnetron today is in the microwave oven.



Sir Mark Oliphant being sketched by Kerrie Elliott.

station which transmitted time signals and Morse Page 28 - AMATEUR RADIO, October 1986



Know vour Second-hand Equipment

THE COLLINS S LINE

The name Collins is synonymous with high quality communications equipment. It is also one of the oldest names in amateur radio's history of comequipment manufacturers. In pre-war days, Collins produced a series of amateur trans agys, comins produced a series of amateur frans-miters with power levels ranging from about 50 watts to a full one klowatt input. At the time, we have a full of the series of the series of the sets and it was not until 1947 that they released their first receiver, the 75A. Its design was, for the time, radical to say the least, with crystal locked front and converters feeding a tunable If it was this design that was to

set new standards in stability and accurate fre-

Soon after this, Collins released their mechanical filter, which was able to produce a flat top, steep sided selectivity curve which was almost possible to achieve with normal tuned circuits impossible to achieve with normal tuned circuits. These filters made the generation and reception of single sideband much simpler and effective. The last of the 75 series, the 75A4 is still looked upon as a classic in the design of amateur SBB receivers, and it was released in 1955. Soon after this, Collins produced their first SSB transmitter,

the KWS-1. the KWS-1. However, very few of these were ever imported into Australia due to rather stringent import restrictions that applied at that time and also, no doubt, to the very high price. In those days, the average Australian amateur thought himself very lucky if he owned a war disposals receiver such as an ARBB and either a modified surplus transmitter, or a home built unit, perhaps incorporating the latest Geloso VFO unit.

Collins produced the first amateur SSB trans-ceiver in 1957, the KWM-1. This covered the 20, 15 and 10 metre bands with a pair of 6146 tubes in the final

It was in 1959 that the Collins S-Line was leased with the 75S receiver and 32S transmitter which were imported into Australia in small



THE COLLINS 75S RECEIVER

The 75S receiver was produced in two versions, the '1' and the '2'. These were double conversion designs with a tunable first IF at 3.155 to 2.955 MHz and the second IF at 455 kHz with a 2.1 kHz filter for SSB reception. All Collins receivers from the original 75A on used a permeability tuned VFO to give linear calibration and high stability.

The amateur bands from 80 to 10 metres were covered in switchable 200 kHz segments with only one segment, 28.5 to 28.7 MHz supplied as standard on 10 metres.

standard on 10 metres.

The all tube line up was 6DC6 RF stage, ½6U8 first mixer, ½6U8 second mixer, ½6U8 crystal oscillator, 6DC6 first IF, 6BA6 second IF, 6U8 product detector and BFO. 6AT6 AM detector, AGC detector and first audio, 6BF5 audio output, 6AU6 VFO and 1/26U8 isolation amp. Two of the new silicon diodes were used as power supply

The main tuning dial was calibrated in one

kilohertz divisions widely enough spaced to allow frequency to be read accurately down to about .25

The 75S-2 was designed for extra frequency coverage with an additional 14 band positions.
With the appropriate crystals installed it was ssible to tune any frequency between 3.4 and 30 MHz. These receivers were built to the highest commercial standards and, in fact, probably more were used in commercial point-to-point services than were ever sold to amat

an were ever sold to amateurs.

The original price of the 75S-1/2 receiver is not known (perhaps someone can fill me in). Second-hand value is very dependent on condition. Older Collins receivers and transmitters are like Leica cameras — collectors items.

The 75S-1 in excellent condition is about \$200 and the 75S-2 about \$225.



THE COLLINS 32S TRANSMITTER This is a matching transmitter for the 75S receiver described above. Almost identical in appearance

to the receiver, the 32S used the same type of VFO and mechanical filter as the receiver. final stage used a pair of 6146 tubes to give around 100 watts output. Collins were among the first to employ negative RF feedback across the final stages to reduce inter-modulation distortion Japanese manufacturers did not discover this until Kenwood introduced it in the TS-820 some 18 years later! With the same VFO and IF set up, the ransmitter and receiver could together to transceive. This worked very well compared to some of the early Japanese efforts which did not guite come-off. The 32S required a separate power supply with 800, 275 volt HT plus 6.3 volts AC and -60/80 volts bias.

6.3 volts AC and -60/80 volts bias. The Collins 516F2 power supply met these requirements, but most of these operated from 115 volts AC only. Tube line up of the 32S transmitter consisted of 61/8s, 6DC6s, 12AT7s and a 6CL6 driving the two 61/4s. The 32S-1 is the amateur band version while the 32S-2 has an additional 14 crystal positions for use on other required frequencies. Second-hand value today would be about \$225 for the S-1 and \$250 for the S-2. The addition of a matching power supply would add about \$75 to these prices but many of the transmitters in use here have home-made power supplies which might not be worth very much.

Often this equipment is sold as a matched pair and this is certainly the best way to buy, although it is often cheaper to try and buy each unit

THE COLLINS 75S-3/B/C

These are up-graded versions of the S-1/2 re-ceivers, released about 1962. Additions to the earlier series included a most effective notch filter, a variable BFO for CW reception, an optional filter for CW and RTTY and selectable AGC decay time. Appearance is the same as the 75S-1/2 with the Appearance is the same as the 755-1/2 with the addition of a couple of control knobs. The B-model is the amateur band- only while the C has the additional crystal board. Price of these receivers when new (1972) was \$1223 for the B and \$1310 for the C. Second-hand value today would be about

Ron Fisher VK3OM 3 Fairview Avenue, Glen Waverley, Vic. 3150

\$300 for the B an \$325 for the C. S300 for the B an \$325 for the C. Collins enthusiastically identify early or late models of this series by the Collins badge above the dial which was changed from a winged to a round type badge about half-way through the production run. A round badge model will usually

nand a higher price

THE COLLINS 32S-3 TRANSMITTER The matching transmitter for the above receiver, is

similar to the S-1 but again ungraded in the Illowing ways.

A CW spotting control to facilitate CW netting, and provision for RTTY operation. Many of the remarks on the 75S-3 receiver also apply to the

The 32S-3A has the extra crystal board for extended frequency coverage.



THE COLLINS 30L-1 LINEAR AMPLIFIER This is the companion linear for the above receiver and transmitter combination. Also usable with the Collins KWM-2 transceiver to be covered in a later

Fully self-contained with power supply, the 30L-1 uses four 811A tubes in parallel. Rated at 1000 watts PEP input with 70 to 100 watts of drive, but watts PEP input with 70 to 100 watts of drive, but actually capable of somewhat higher power. Power output 700 to 800 watts. This amplifier features the usual Collins superior design with negative RF feedback and automatic load control. A very desirable linear for any amateur application, Price when new (1872) was \$731 but today would be worth around \$1000 if you can find one.

NEW ABC RADIO NETWORKS

FM transmitters at 42 sites in Queensland and Western Australia will begin broadcasting programs on the ABC's new Second Regional Radio Network in the first half of 1987. io Network in the first half of 1987. The first phase of the new network, costing over \$1.6 million, will benefit 40 000 people in Queensland and 17 000 in Western Australia. Another 300 sites around Australia are to be included in the network over the next 10 years.

FIBRE OPTIC NETWORK

Telecom Australia plans to lay a 2 700 km optical fibre link between Perth and Adelaide by 1989. This is part of a national optical fibre program to connect all Australian mainland capital cities by

The Perth-Adelaide link will be the world's longest link without intermediate terminals.

Later links will be Adelaide-Darwin and Adelaide-Brisbane, with a spur line connection to

Melbourne and Sydney A fibre optic loop for the Melbourne central business district is nearing completion and a similar loop is being considered for Sydney. The optical fibre links consist of hair-thick

strands of extremely pure glass and are capable of carrying all types of telecommunications traffic.





Equipment Review

3 Fairview Avenue, Glen Waverley, Vic. 3150

Ron Fisher VK3OM

THE KENWOOD TM-2550A / 2570A TWO-METRE FM TRANSCEIVERS

These transceivers have been released as updated replacements of the TR-7950 series, two metre FM transceivers. The TR-7950 was reviewed in the July 1983 issue of *Amateur Radio*. The new transceivers retain all of the desirable features of the old models while introducing several updates that again put Kenwood into the lead with two metres FM. Perhaps the outstanding achievement is putting 70 watts output (the 2570A) into a mobile size package.

The TM-2550A is rated at 45 watts output which is the same as the original TR-7950. This review will concentrate on the higher powered model.

TM-2550A/2570A DESCRIPTION These two metre FM transceivers have identical features except for the difference in power output. Because of this, the higher powered version is slightly larger because of the increased size of the final amplifier heat sink. Overall dimensions are 180 x 60 x 215 mm (WHD), for the 2550A, and 250 mm (D) for the 2570A. Weight is 2 and 2.35 kilograms respectively. In addition to the larger heat sink, the 70 watt model also has an in-built ng fan which is thermostatically controlled. Full coverage of the two metre band is provided

in five kilohertz steps. Required frequencies are selected by entering them on the keyboard, then transferred to one of the memories. Memories are selected by the large right "tuning " knob. Any one of the memories can be designated a priority channel with the receiver sampling this every five seconds and sounding a loud double been if the channel is active. Also, any of the memories can be selected to be skipped during the memory

The LCD display has been greatly expanded on e new transceivers. The old TR-7950 used an the new transceivers. LED S-meter and LEDs to indicate reverse re peater operation, the centre tuning indicator and the priority channel selection. These are now all prograted into the LCD display.

The S-meter is particularly good with 24 cali bration points as against only seven on the old 7950. Just how the S-meter actually works out in practice will be covered later in the test section. However, the greatest update in the new models is the list of options. As our review transceivers were not actually fitted with any of these, I can only describe them and then leave the choice to you.

obscribe them and then leave the choice to you. First is an option that will be taken up by amateurs with impaired sight, the VS-1 voice synthesiser. At the touch of a button, this will announce the frequency, memory channel selected as well as information on the optional call

systems possibly fitted.
Next, the MU-1 "Digital Channel Link System".
This wondrous sounding gadget performs all sort of magic tricks, however, it is necessary to have two (or more) similarly equipped transceivers to make things work. Firstly, if it becomes necessary to change frequency, the DCL searches for a clear channel, then returns to the original channel and informs the other transceiver and they then both to the new frequency. completely automatically. If the CD-10 call sign display unit is connected to the transceiver, stations who have called you will have their call signs displayed on the screen. I hope in the future to obtain a pair of the complete DCL plus call display units and actually try them out. If any readers have had experience with them, please let me know.

ON THE AIR

With a transmit current drain of 16 amps, a solid power supply is required. Kenwood recommend their PS-50, which is rated at 20 amps output. I used my Icom PS-15 and also Yaesu FP-707 power supplies and both supplied the required current with no trouble. The 2550A requires just under 10 s on transmit, so a 10 amp supply should amps on transmit, so a 10 amp ouppy since suffice so long as you keep your transmissions to reasonable length

Selecting frequencies, repeater offset and the entering them into the memory is very easy. As each number or function is selected, a beep is heard to indicate that the command has been accepted.

scanning facilities provided. The memory scan can be programmed to stop on a busy channel for either a preset time of up to about 10 seconds or at the conclusion of the transmission. Selected channels can be skipped during the scan by means of the

Two types of band scan are available. First, a full band scan and second a programmed scan. The upper and lower points of this are entered into memory 'd' and memory 'u'. Scanning direction can be reversed simply by pressing either the up or down buttons on the microphone. Scanning speed can be increased by holding these buttons down. Another of the nice features is the centre stop facility. This means that scanning will only stop when the signal is properly tuned onto the

equency.

One of the nice features on these new units is the rear illumination of the front panel. For night time mobile operation this certainly sets a new standard. All keyboard buttons and other control labels feature this in a translucent green - very

Received audio quality from the larger-than-average internal speaker is quite good. The speaker is mounted in the top of the cabinet, good for mobile operation so long as it is not firing up into the underside of the dashboard. With a good quality external speaker, the received audio is exceptionally good

Transmit audio was checked with two microphones, the supplied MC-42S hand-held with up/down scanning buttons and the MC-60A desk type. The hand-held produced crisp clear audio while the extended response of the MC-60 was reported as "broadcast quality." I am pleased to see that Kenwood have fitted a now-standard eight pin microphone connector which is compatible with other current models. The locally supplied earlier model, the TR-7950, had, for some reason, a six pin connector which caused many compatibility problems. Strangely though, eight pin connector.

Transmit tests were carried out over extended

periods to check retention of output power. Many transceivers tested show a falling-off of power after a short time. Both of these transceivers delivered consistent power over several hours of

Operation was also checked at supply voltages below 13.8 volts. Power output fell slowly down to about 10 volts and at this point, the 45 watt model was down to 20 watts, and the 70 watt unit was down to 35 watts. Below this voltage things died

rather rapidly.

47 watts

97 amos

ON TEST

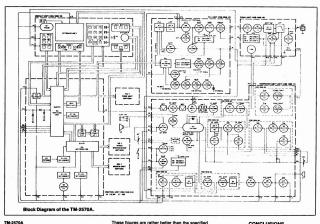
The following test equipment was used to produce the figures obtained during these tests.
Yaesu YP-150 terminating RF power meter, Marconi TF-955/T terminating RF power meter, Marconi TF-955/15 terminating RF power meter, Marconi TF-955/15 signal generator, Daven audio power output meter, AWA F242A noise and distortion meter. All tests were carried out with a regulated 13.8 volts applied to the transceivers

unless otherwise stated.

Transmit Power Output The two transceivers were checked with the following results. TM-2550A

POWER O/P LOW POWER OVE HIGH

> 4.5 watte AMATEUR RADIO October 1986 - Page 31



65 watts 15.8 amps

4.7 watts 3.3 amps

It is noted that the low power output setting is adjustable over a fairly wide range. The above figures were taken with the factory set power and no attempt was made to alter this. Receiver Tests

The S-meter was checked first. The new LCD bar-graph has two indicators per S-point, with calibration points at 1, 3, 5, 7, and 9. There are then six indicators to show S9+. S5 S7 2.0 2.5

S9 3.1 4.0 5.0 This works out to 2 dB per S-point or about 1 dB per I.

This again shows that S-meters are very different on VHF transceivers compared to HF

equipment. As many signals are obviously stronger than 6.3 uV, this strength indicator is only useful for relatively weak input levels.
Receiver sensitivity was checked at 146 MHz

with the following results.

RF INPUT SINAD S/N RATIO 2 uV

Full quieting was reached at about 2 uV with a noise output of -44 dBm.

Receiver audio output was checked by feeding the extension speaker output to an eight ohm terminating power meter with the noise and e extension rminating power meion meter bridging this.

Max Power Output 3 25 watte 2.00 watts

These figures are rather better than the specified 1.5 watts at five percent distortion, but I still think that a mobile transceiver of this type should have at least five watts output at below five percent

Received current drain was checked. The 2550A was 6 amps squelched to 8 amps with one watt of tone output. Relative figures for the 2570A 8 amps and 1 amp.

Frequency stability and accuracy for both transmitter and receiver were checked and found to be better than 100 Hz under all conditions. INSTRUCTION MANUAL

As I mentioned in my recent review of the TS-440S, Kenwood instruction manuals have improved somewhat of late. I hope they do not stop at this point because there is still a long way

to go.

The addition of some good definition photographs of the internal layout would be useful, as would a printed circuit layout. It know that much of the information is included in the optional workshop manual, but as the cost of these is no

about \$30, this may be beyond many tightbudgets.

However, the following information is included:
Controls and their functions; Installation;
Operation; Maintenance and adjustment;
Operational accessories; Block diagram and

cifications

specifications.

Operational instructions are very well written and cover a commendable 17 pages. With all of an and cover a commendable 17 pages. With all of the page of the put set and microphone gain control

CONCLUSIONS

CONCLUSIONS
These are both socient transcrivers and are because the socient transcrivers and are powered, two neiter BM (g. Their somewhat large perspense them more subside for a base station operation rather than for mobile use station operation rather than for mobile use station operation rather than for mobile use station operation rather than for mobile was station operation rather than for mobile was stationary to a station of the stationary than the stationary that the stationary than the stationary that the stationary than the stationary that the stationary than the stationary than the stationary than the stationary than the stationary that the stationary than the stationary than the stationary than the stationary than the statio actually runs cooler than the lower powered

Thanks to John Hill of Emtronics, Melbourne Division for the loan of the TM-2570A and to Kerwood Electronics Australia Pty Ltd., via Eastern Communications for the loan of the TM-2550A

EVALUATION AND ON-AIR TEST AT A GLANCE of the Kenwood TM- 2570A . . . Serial No 7031506

PPEARANCE raging " * Single carton full of foam box insert.

ight and Size

Weight and Size

"Not the smallest or lightest. For mobile use you might
prefer one of the smaller units.

External Finish

""Very well finished. Although the all black-colour
scheme is a bit sombre.

Construction Quality

""Well put together with good quality components.

RONT PANEL

**PROMET PANEL.

ocation of Controls

**There are 19 knobs or push buttons, plus a 18 button keyboard. Outle a feat to fit them all in.

Size of Controls

**Oue to the above, buttons are small and hard to operable, especially under mobile conditions.

**The Controls of the Control of the Controls of the Controls of the Controls of the Control of the Controls of the Control of the Co

elling

* * With the fully illuminated front panel, all labelling is very clear and concise.

50 watts Page 32 - AMATEUR RADIO, October 1986

us Indicators

* * * On air, centre tune, repeater offset, etc. Lots of in

FIVER OPERATION

ies

*There are 23 memories with frequency, repealer
offset, and even telephone numbers (not much use in
Australia).

nsitivity
****Excellent. See Test Section

d Audio Internal speaker is good and top mounted. With external speaker — very smooth quality SMIT OPERATION

TRANSBIRT OPERATION

"Provided for sink, very good. The 70 wait version is the
Transmit Audio to prevend mobile unit available.

"With supplied hard-microphone — good. With
opplical McCo microphone — excellent.

"With built-in fan and adequate heat sink — excellent.

Cooling (2550A)

* Actually runs warmer than the higher powered model.

Metering * Power output indicator only.

Book

Better than many. Operation covered very well but more information needed.

WERALL RATING
"""Il seems we are never totally happy with any thing, but overall performance is excellent so long as you have the space to fit it in. RATING CODE
* Pront, ** Satisfactory, *** Very Good, **** Excellent

SHADE YOUR STORY IN AD

JOTA 1986

Greetings once again to all and especially to anybody who has decided to, or been asked to, operate a JOTA station this month.

operate a JOTA station this month.

The 29th Jamboree-on-the-Air will be held over
the weekend of October 18-19, 1986, beginning at
0001 hours Local Time on the Saturday, JOTA will onclude at 2359 Local Time on Sunday. Stations

may operate for all, or any part of this period. Either you have every thing under control or, as in most cases, you hope that all will be okay on the day. We know any effort to assist will be much appreciated. Remember these annual events that

happened previously for us are still new to the next generation. If you can go portable at a JOTA location, eve hough you may not stay long, it is the kind of sublic relations exercise that is good for both

participants. This year, the Scout and Guide Movement has decided to be the party to initiate a station. It is hoped they will have success and not receive too many "knock-backs" from potential operators.

many "knock-backs" from potential operators.
One highlight of the day will be the Chief Scout/
Governor-General's broadcast from Canberra.
(Dural station will avoid last years failure by a VHF-relay link if required owing to poor propagation).
Reliable VHF communication is good over the mountains and into VK1

mountains and into VK1.

Do not forget, the JOTA station fills in the log and report sheets, supplied by your Scout/Guide Leader. You do not have to fill them in but they are necessary for final assessing of the success of JOTA activities.

During discussion regarding the day, ask how many guests you can expect and if a leader will always be present. If possible always require a always be present. If possible always require a pole-tower or tree to be needed for one end of your dipole. This is a favourite pastime for the troops and generally ends-up with their flag atop. The day does involve some work, but it is a

good excuse to do something different.

—Contributed by John Bunn VK2NOJ, VK2 JOTA Co-ordinator,
PO Box 1056, Parramatta, NSW, 2150

SPECIFICATIONS FOR CONSTRUCTING PIPE FOR A FOREIGN GOVERNMENT

All pipe is to be made of a long hole, surrounded by plastic or metal centred around the hole. All pipe is to hollow throughout the entire length. Do not use holes of different length than the pipe. The inside diameter must not exceed the outside diameter, otherwise the hole will be on the

All pipes over 500 feet in length should have the words "Long Pipe" printed clearly on each end, so the contractor will know that it is a long pipe. Pipes over two miles in length must also along pipe. Pipes over two miles in length must also have the words "Long Pipe" painted in the middle, so the contractor will not have to walk the entire length of the pipe to determine whether or not if it is a long

pipe or a short pipe. All pipes over six inches in diameter must have the words "Large Pipe" painted on it, so the contractor will not mistake it for a small pipe.

Flanges must be used on all pipes. Flanges must have holes for bolts quite separate from the

must have holes for boits quite separate from the big hole in the middle. When ordering 90, 45 or 30 degree blows, be sure to specify right hand or left hand, otherwise you will end up going the wrong way. Be sure to specify to your vendor whether you want level, upfill or downhill pipe. If you want lovel, upfill or downhill pipe. If you see the cownhill pipe for going upplill, the water will flow

All couplings should have either right hand or left hand threads, but do not mix the threads, otherwise as the coupling is being screwed at one pipe, it is being unscrewed at the other. Contributed by Bill VKSCFL, via Bruce Bathols VKSUV

SHADE YOUR STORY IN AD

THIS OCTOBER.



- The lure of tropical bands
- Radio in Macau
- A career in electronics
- HOTOL: a boost for ESA
- MIDI, the computer music link
- Plus news, reviews, projects and more!

eti

Electronics Today International





— an expanding world

| AMATEUR BANDS BEACONS | | | | | |
|-----------------------|-----------|-----------------------|--|--|--|
| QUENCY | CALL SIGN | LOCATION | | | |
| 50.010 | JA2IGY | Mie | | | |
| 50.060 | KH6EQI | Honolulu | | | |
| 50.075 | VS6SIX | Hong Kong | | | |
| 50.109 | JD1YAA | Japan | | | |
| 52.013 | P29BPL | Loloata Island | | | |
| 52.020 | FK8AB | Noumea | | | |
| 52,100 | ZK2SIX | Niue | | | |
| 52.150 | VKOSJ | Macquarie Island (Key | | | |
| 52.200 | VK8VF | Darwin | | | |
| 52.250 | ZL2VHM | Manawatu | | | |
| 52.310 | ZL3MHF | Hornby | | | |
| 52.320 | VK6RTT | Karratha | | | |
| 52.325 | VK2RHV | Newcastle | | | |
| 52.350 | VK6RTU | Kalgoorlie | | | |
| 52.370 | VK7RST | Hobart | | | |
| 52.420 | | Sydney | | | |
| 52.425 | VK2RGB | Gunnedah | | | |
| 52.440 | | Townsville | | | |
| 52.450 | VK5VF | Mount Lofty | | | |
| 52.460 | VK6RPH | Perth | | | |
| 52.465 | VK6RTW | Albany | | | |
| 52.470 | VK7RNT | Launceston | | | |
| 52.485 | VK8RAS | Alice Springs | | | |
| 144.019 | VK6RBS | Busselton | | | |
| 144.400 | VK4RBB | Mount Mowbullan | | | |
| 144.410 | VK1RCC | Canberra | | | |
| 144,420 | VK2RSY | Sydney | | | |
| 144.430 | VK3RTG | Glen Waverley | | | |
| 144.465 | VK6RTW | Albany | | | |
| 144.480 | VK8VF | Darwin | | | |
| 144.485 | VK8RAS | Alice Springs | | | |
| 144.550 | VK5RSE | Mount Gambier | | | |
| 144.565 | VK6RPB | Port Hedland | | | |
| 144.600 | VK6RTT | Karratha | | | |
| 144.800 | VK5VF | Mount Lofty | | | |
| 144.950 | VK2RCW | Sydney | | | |
| 145.000 | VK6RPH | Perth | | | |
| 432.057 | VK6RBS | Busselton | | | |
| 432.160 | VK6RPR | Nedlands | | | |
| 432.410 | VK6RTT | Karratha | | | |
| 432.420 | VK2RSY | Sydney | | | |
| 432.440 | VK4RBB | Brisbane | | | |
| 432.475 | VK3AQU | Melbourne (Keyer) | | | |
| 432.535 | VK3RMB | Mount Buninyong' | | | |
| | | | | | |

1, A letter from Dick Forrester VK3VU, advises of a frequency change for the Ballarat Amateur Radio Group Beacon to 432,535 MHz to conform with the WIA National Band Plan. It also confirms for me the existence of the beacon which has not been listed for some time and so now reappears with this issue

DXPEDITION TO NIUE

Nev VK4ZNC, will be leaving on November 14, to mount another DXpedition, this time to the island of Niue, which has the prefix of ZK and from where I have been listing a six metre beacon for

where I have been issing a six metre beacon or some time under the call sign of ZKSSIX. Niue is about 4300 km from Sydney at longitude 170 degrees and latitude 18 degrees, placing it east of Tonga. Usually the best Es single hop distance is around 1600 km so it will be more than two hops to Sydney and more than three to VK5. Contact will be possible should a particularly large Es cloud develop and operators will have to be extra alert if seeking a contact. An early morning contact would seem more likely than later in the day, although there is no guarantee of this either as Es is unpredictable and that seemed the most likely mode for any contacts made. Good luck,

Nev has also indicated only about one third of the stations that contacted him have claimed their VK9LC card for the Lord Howe Island expedition. He wants to clear any backlog of cards before leaving for Niue and will make QSLs available to those who want them until the end of October 1986, after that — no cards! A return postage stamp (no envelope) is all that is requested.

VISIT TO ALICE SPRINGS During the past month I made a trip to the Northern Territory and whilst in Alice Springs. I

VHF IIHF

Northern Territory and whilst in Alice Springs, I had the pleasure of meeting some of the members of the Alice Springs Radio Club. On the appointed night, we assembled in the luxurious lounge of the Sheraton Hotel. Those who met me were the President, Torry VK8TM, Secretary, Peter VK8ZLX, Jeff VK8GF and Tim VK8KTM.

Most of the discussion was VHF orientated naturally! Jeff VK8GF and I had known one another for some 25 years and some of our early days exploits on one metre with super-regenerative equipment caused smiles and interested comments from the other listeners. Other subjects dealt with included beacons, re-peaters, ORM from other services at repeater sites, the six metre band and its likely promise of good contacts in the future.

The Alice Springs boys are well aware that their unique position geographically means they will be much sought after again this year for two metre contacts in particular and they will be going all out to provide those contacts around Australia. Improved antenna systems and increases in power will be helpful. They have not overlooked 70 cm and stations with reasonable power are likely to be perating from there as well.
With the likelihood of another extremely good

Es season this coming summer and with that meaning good potential for two metre contacts, the Alice Springs boys have certainly got their act together and I hope the rewards will be contacts both ways on all three bands.

It was certainly a great evening spent with some very fine guys and one to be remembered for a long time. On leaving, they presented me with a large "Outback Australia" QSL card depicting Ayers Rock and signed by all four attending. I shall treasure that gift. Thank you.

ROSS HULL MEMORIAL CONTEST During my discussions with the Alice Springs boys, the matter of the Ross Hull Contest was included as I was anxious to obtain the opinions of included as I was anxious to obtain the opinions of a very keen group of operators. I took with me the details of what could be possible changes to the Contest this year, in the light of experience and comments received from last year. They added to the already known ground swell

of opinion that two major factors were preventing of opinion that two major factors were preventing operators from showing enough interest to submit a log. They agreed there was little doubt that there are many stations operating during the summer period and giving out numbers and who never submit a log. (VKSLP has a list of 404 call signs on

six metres alone for last summer). Whilst it was agreed every encouragement should be given to amateurs to construct or obtain equipment for the UHF bands, there are many amateurs who, for a variety of reasons, may never get beyond the 70 cm band. If the Contest was limited to the 53 ed to the 52, 144, and 432 MHz bands (at least immed to the 52, 144, and 43, MTz bands (at least for the time being) it is possible that the already high level of participation could result in the log return like that of the 1960s, when development on the bands above 432 MHz had not been very great. Those able to operate 1296 MHz and above will object, which is natural, but if the Contest is to survive then something has to be done to convince more people they too have a chance of a certificate and hence enter a log.

If we were to revert to the best seven days score

then even more operators are given a chance to be in the running. Not everyone can spare three solid weeks before the transceiver.

On the matter of scoring, I do not want to pre-empt what the Contest Manager may be deciding, but last year's one point per contact was judged a disaster! Short distance contacts and very long distance contacts on six metres are certain worth more than one point. Why not two points up to 1000 km, 1000 to 2000 km one point, over 2000 km two points? On 144 MHz; up to 500 km two points, 500 to 1000 km five points, over 1000 km 10 points, 432 MHz; up to 500 km four points, 500 km 10 points, 432 MHz; up to 500 km four points, 500 to 1000 km 10 points, over 1000 km 15 points. For contacts with overseas stations: 52 five points, 144 10 points, 432 15 points. This would make it worthwhile persevering with that ZL or FK contact even if it takes a while to make it. And what would be wrong with offering an extra 10 points for every completed 10 contacts in the log book, irrespective of the band; le the running total as it appears.
You might then consider it worthwhile working the operators already on the band instead of looking for the unworked prefixes (last year) for extra bonus points.

What ever scoring table is produced, it will not suit everyone, hopefully it will suit the majority. Some will say it is over simplified, but then that may be a good idea, it means less fussing around with the dividers deciding on distances. If we do no more than sort out the 1600 km distance from Adelaide to Brisbane (optimum Es path) and place it in the middle of some scale (as it is with 1000 to 2000 km) then something good will have been done. In the 1960s, the then 1000 mile (1600 km) path for a change to 10 points per contact started in the Brisbane metropolitan area, some stations were two points, other were 10, what a shambles trying to sort them out! On the above scales no change over points occur between any two capital cities. There will be isolated operators in country areas where such changeovers could occur, but

most will benefit for such a spread of distances.

There is plenty of food for thought. At least contacts under 100 km have not been cut out as some would like. I believe the rules for the Contest will be in November AR, and could be fairly close to the above - at least you have something

OVERSEAS ON SIX METRES

CQ ham radio for June 1986, from Japan (courter CO ham radio for June 1986, from Japan (courses) VK6RO) shows we are really in the low part of the cycle. On 50 MHz the only stations being worked from Japan have been HLI, 2, 3, 4, and 5 from Kores, VS6s XMQ, XMT, XOR, XLN, and XNF from Hong Kong plus the VS6SIX beacon; and several reports of UA-RADIO on 50.610 AM, All Several reports of UA-RADIO on 50.610 AM, All several reports of UA-RADIO on 50.610 AM, All control of the Mill Several Course of the Mill several reports of UA-RADIO on 50.610 AM, All several reports of UA-RA were recorded in May 1986. Quite a few of the HL contacts have been on FM and operation has taken place above 51.000 MHz.

From the same article, it appears 9M2KY, from Malaysia, will be on 50 MHz which could be another country to look for should six metres open

to the north.

BT4YRC, in China, has apparently been having two metre SSB contacts into Japan starting last May. One can envisage the dog-piles if he is a Ione operator!

WINTER SPORADIC E

Most years there is a period of improved six metre conditions during June and July, and this year appears to have been no exception. Although I appears to have been no exception. Although it was away for quite a while during that period, news of contacts is filtering through. Not a lot has taken place from the VK5 end except on two metres between VK5 and VK3.

VK7ZIF, was reported working VK2XJ around 0540 on 24/6; VK2BA reported working FK8EB on

0540 on 24/b; VKZBA reported workling rives to on 13/7 around midday local time, strong signals, so probably others in VK2 worked him as well; ZL television heard in VK5 strongly for five minutes around 0500 by VK5LP; a number of meteo scatter contacts taking place between VK3 and VK2 which is interesting. Perhaps aircraft enhancement is helping some of these contacts tool From about the time you read these notes there

should be some increase in contacts via Es as we begin to approach the summer period once more.

Once again I say to all to be aware of the potential for two metre contacts during periods of high Es at



SMIRK identities, Ray Clark K5ZMS, Secretary (left) and Tex Kennedy N5TX,

this very low part of the sun spot cycle. More stations will also be trying 70 cm this summer and again there will be a number of stations going out portable over the Christmas/New Year period, which also leads to more possible contacts. I am sure the summer of 1986/87 will be a very exciting one on VHF

VK5LP is secretly praying for the hot weather to come soon in the hope the two metre rotator will become unfrozen. At the moment it is stuck pointing to Mount Gambier and defies efforts to move it. Being over 70 feet (21 metres) off the ground does not help to improve matters! Might have to be content with just working ZL this year! The Newcastle Beacon, VK2RHV, on 52.325 MHz was available to VK5 for about half an hour MHZ was available to VK5 for about half an hour today (18/8 2330) peaking to S3, but no stations to work. Channel 0 also there at sufficient strength to be readable. Sydney Beacon, VK2RSY, on 52.420 MHz very weak.

One could speculate at times as to the potential for contacts if amateurs were permitted to run the same power as Channel 0. It is an interesting exercise when in the shack doing other things to monitor Channel 0. Some days it is there for hours going in and out of the noise, occasionally peaking to S9, etc. Recently, I observed it very peaking to 59, etc. necessity, I observed it very strongly around 0100 one morning for more than half-an-hour at a level good enough to produce colour. This would have had to be Es. The occasional lifting in strength observed on other occasions could be due to meteor pings. It has often been said that six metres never closes, only operators stop. That statement may be hard to actually prove, but there is evidence the band is open far more often than we give credit. That is why it is such an interesting band and worthy of more use

FROM THE PAST

Being of an inquiring nature and interested in items from the past, I was looking through some old QST magazines and in May 1936 came across an article Exploring Below One Metre which gave details of practical equipment for operation on 325 MHz. An RCA 955 valve was used as a superregenerative detector sitting in a specially made good quality socket. Hair pins of No 12 wire were ed to form the filament lines and two turns of No 16 wire and tapped were used for the grid/plate inductor. Satisfactory contacts were being made over five miles (8 km). In the June 1940 issue the following UHF Records existed: 58 MHz: WIEYM to W6DNS on 22/7/1938, 2500 miles; 112 MHz: W9WYX/9 to W9VYK/9 on 7/10/1939, 160 miles; 224 MHz: W1AIY to W1KLJ on 27/4/1940, smiles. Howevo on 28/4/1940 W6BCX worked W6DNI to extend

on 28/4/1940 W6BCX worked W6OIN to extend the 112 MHz range to 200 miles eporting international Dx on MHz and selecting international DX on MHz and the 12 MHz range and 1200 MHz was 37 miles and the 1200 MHz was 37 miles and this was bettered in England by G8DD and G3GC, who worked 75 miles. The same two had worked 46 miles on 2400 MHz, but were unable to attack the USA record of 150 miles due to lack of suitable locations

Since those early days, distances on all bands have been lengthened many times and records continue to be set, but it does not hurt to become nostalgic sometimes!

I also have some copies of a magazine called I also have some copies of a magazine caused in the interests of Australian amateur radio, dated 1928 and 1929. These were published each month by the New South Wales Division of the Wireless Institute of Australia and distributed free to its membership. The Editor was J M Bristow. President of the Division was E G Beard with W R Felton as the Secretary. They carried notes about the amateurs from various districts of Australia, technical news. and information including new products, WIA notes on the Federal Convention, also some radio theory, plus articles on personalities. Quite interesting! on amateur

CLOSURE

Before the Editor starts lifting his pen to erase any of this text I will close off for now. It has been a difficult month to fill the column, having been absent for four weeks did not help and the winter doldrums usually adds to the problems. Activity should pick up soon and there should be more to

This months thoughts: Why does a heated argument create a chilly atmosphere? and Sometimes a man gets a reputation for wisdom simply because he does not have enough money to make a fool of himself!

-73 The Voice in the Hills



Try Thicl

Tuning Mobile HF Antennas

Tie a length of nylon line to the tip of the antenna before commencing tuning. The length of the line should be a little longer than the length of the car Assuming that the antenna is mounted on

the rear bumper of the car, drape the nylon line across the top of the car.

Take a VSWR reading of the antenna (using

minimum power to reduce QRM). Pull on the nylon line to bend the antenna toward the body of the car and note the new VSWR reading. the VSWR has dropped that antenna is short. A short antenna is capacitive. Adding shun-capacitance; ie increasing the capacitance between the antenna and the car body by reducing the distance is the same as adding series inductance.

Use this technique after each adjustment and you will quickly be able to resonate the antenna.

Contributed by Earl Russell VK3BER

MAKE YOUR OWN LARFLS Rob Abel VK2ERA, 106 Derwent Street, Glebe, NSW. 2037.

A neat and simple way to tailor make your own

labels for home-brew gear is as follows: Using ordinary domestic self-adhesive vinyl* (the type used to cover library books, or line kitchen shelves), rub on your chosen label with rub-on lettering transfers,** which are readily

available in a wide variety of sizes, colours and available in a most styles.

Next cover the lettering with another piece of clear self-adhesive vinyl (with the backing removed), thus making a "sandwich" in which

Cut the label to the appropriate size and shape, peel off the backing of the bottom layer and smooth carefully into the required position. This makes a very neat and tidy label and as the lettering is covered it will not rub off with

The label colour is limited only by the colour of the material available.

For instance — on black painted articles clear contact is used for both top and bottom layers with white lettering. I used this method on a small home- brew transceiver with very satisfying results.

Con-Tact from Nylex is one type of self-adhesive vinyl.

Lettraset, etc.

BUSHFIRE NETS The New South Wales Bush Fire Council has

begun installing a series of repeater networks.
The first, at Mount Gibraltar, near Bowral, use an Australian-made 50 watt talk-through re

with an output on 467.725 and receive on 458.226 Five bushfire control centres, with desk-too

trigger base radio systems, now use this repeater for inter-communication.
The system is called *Strategic Radio Network*.
During major bushfire operations they provide an inter-service link between the Bush Fire Council, National Parks and Wildlife, Forestry Commis-

sion, Police, Ambulance and the Army. AMATEUR RADIO, October 1986 - Page 35





It is from good authority that the whole DXCC criteria for their prestigious awards program could be dramatically changed.

I personally feel that this could be for the better, but please John W4FRU and your committee, don't take the attitude of throwing all the old paperwork in the air and saying: "Lot's start

Many amateurs from all continents are members of the ARRL and most take advantage of the ARRL DXCC, it would be prudent to seek input from these members, many of whom have attained very large country totals — some even being on the Honour Roll.

When problems arise and arrogance, vitriolic remarks, and belittling a society's awards becomes a talking point across the amateur spectrum, something constructive should, and must, be done promptly.

The ARRL is renowned for its impeccable record of being of assistance to the fraternity and its Awards Program is the criteria for all countries, so please Mr Chairman of the DXCC Advisory Committee, amend the criteria constructively, committee, amento the criteria constructively, remembering that the majority, if not all DXing amateurs, have struggled to attain their DXCC standings by spending counties hours chasing elusive countries and trying to get their calls recognized. recognised over associate recupined of the associated klanglarbenmelodie, when coming across that rare country where a DXpedition has gone, usually at great expense to the participants. Or, maybe it could be a lone amateur in an isolated

cation wanting a friendly chat.

Next comes the considerable expense of obtaining the valued card, and the accompanying frustration which accompanies such an exercise

— an accepted part of the hobby!

— an accepted part of the hoops.

Mr Chairman, you are respected and renowned for your clear thinking — please give this problem considerable thought before any constructive changes are made as your decisions will stand for decades to come.

COCOS (KEELING) ISLANDS - VK9Y

A much sought after QSL confirmation from one of Australia's possessions that consists of two atolls, comprising 27 small coral islands, with an all up area of (5.5 square miles) 14 square kilometres. This outcrop is located at 12.01 degrees east and 96.50 degrees south — the same latitude as Darwin — and approximately 2 250 kilometres north-west of Perth. Of interest, the highest point is no more than six metres above sea level and it enjoys a hot climate that varies between 22 to 32 degrees. Celsius complimented by a rainfall oegrees Cessus comprimerined by a raintain averaging around 2 000 mm. The climate could be considered unpleasant in the December — February period of the year for the 410 Cocos Malays and 220 Australian inhabitants, due to the

humidity and rainy season. humidity and rainty season.

The main islands are are named West and Home Islands, with other larger coral islands being called Direction, South, Prison, Horsburgh and North Keeling. Probabily each one has its own listory and the locals have a name for them all, as they are all regularly visited to harvest the coconuls, which are in abundance on the Islands. cocoruss, which are in abundance on the islands, which are shaped in a horseshoe formation. Within the formation is an idylic lagoon, approximately 16 by 10 kilometres in area and varies in depth to a maximum of seven metres of bright water, coloured from a bright aqua to a dark green. Outside the perimeter of the horseshoe islands, the Indian Ocean can vary in depth to many thousands of metres.

West Island is the main administration area west island is the final maintain and alea, containing an airstrip, offices, meteorological station, the homes of government personnel, and a school that covers from pre-primary to secondary and is staffed by the West Australian Education Service.

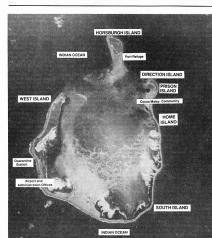
Home Island, is occupied by most of the Cocos Malays, descendants of those who were brought over when Captain John Clunies Ross, a Scottish

How's DX?

seaman, arrived two years after its first habitation by Alexander Hare in 1925. by Alexander hare in 1925. Hare and Clunies Ross both laid claim to the area, even though the North Island was dis-covered by the British sea captain, William Keel-ing of the East India Company in 1609. Hare was de

six years later. Further history of the Island group indicates they were annexed to England in 1857 and in 1886, Queen Victoria granted all land above high water mark to the Clunies-Ross family who nurtured, cultivated and increased the plantations. It was purchased from John Clunies-Ross and his wife Daphne, after five generations of the families rule, for \$8.25 million by the Australian Government left and Daphne and Inches and Daphne and Inches an ment. John and Daphne, now live in Perth. Many amenities are provided on the islands, including a small but modern equipped hospital, with o resident doctor and two nursing sisters in attend-ance, a community radio station (VKW), many clubs and a well stocked grocery/liquor store which is replenished on a weekly basis. Produce including fresh fruit and vegetables are brought to the islands by a charter aircraft which also brings the mail. The arrival of this aircraft is the event of Surface mail, parcels and other hardware are brought in by sea, generally every six to eight

Amateur radio operation is inconsistent, unless one of the employees happens to have an amateur licence. Over the past years there have been many operators heard from this tiny, much sought after outpost. Some Royal Australian Air Force air crews, such as Alex VK9YA and Paul VK9YB, on stopowers during reconnaissance flights across the Indian Ocean, and individuals such as Frank ex-VK9NYG, have changed the status from 151 to the 51st most wanted country on the DXCC ladder and even the Federal QSL Manager, Neil VK6NE, has done a stint of operatving a new country to many DXCC enthusi its. Amateur operators have to be cautious and considerate in the the amount of power they use, as high power, even within the terms of their licence, can cause BCI, the lifeline of community relations in this confined area. One, if not the first to initiate the the VK9 Cocos



Cocos (Keeling) Islands from the air. hotograph courtesy the Royal Australian Air Force





Clean Beaches surround the Lagoon.

prefix was VK9AJ in 1956. His QTH was on Direction Island, however it is impossible to list all operations from this area. So when you hear VK9Y., call and say you know

a little of the area he or she is operating from, provided the operator has not got the multitudes calling, and they are in the middle of a dog-pile!



Nell VK6NE, relaxing on Cocos.

—Photograph courtesy Neil Perifold VK6NE

HELP!!!

Information from any operator who can assist with information on the whereabouts of Art ex-ZDIFG, who operated from Nglais in 1958.

This information is required by Bill VKIWB, for confirmation of two phone contacts. All replies will be appreciated at Bill's new CTH which is: 8 Eacham Avenue. Paradise Lakes. 01d, 4126.

Australia.

The co-operation of overseas magazines and DX news sheets would be appreciated.

FAILURE TO QSL

Joy VKZEBX, notes that she has had no success for the following call signs in the QSL's "In the Bag" department.

AMX (hyperus and direct):

9HtEU (bureau); A4XX (bureau and direct); EABLS (bureau and direct); EABANT (bureau) FG4CBIFS via FG7CB (direct); FG7CC (two direct); GD4DPK (direct); J87BS (two direct); T1GV (direct); P1BM (direct); T1SJ via T12J (direct); YNSRR (two direct); and VE1BZV (one bureau and four direct).

very frustrating, Joy. Unfortunately, it is a way of life that has escalated over the last decade and we have to live with it. On the brighter side, the nonreturn of cards is quite a low percentage and in my particular case, after much nail-biting at times, the return is 100 percent. Trying to procure cards on other people's behalf, I have to admit, has not been so successful. With the increase in postage rates, one has to

with the increase in postage rates, one has to think twice about sending a card direct, however the members of the institute save with the voluntarily manned bureaus. If they are keen DXers the bureau virtually pays for their membership.

AMATEUR RADIO TO THE RESCUE — AGAIN In mid-June, Bharathi VU2RBI, a YL operator and

In the Journal of Hall (1997), the John American Charles and Hall (1997), and the John American Charles (1997), and the Vestal Hall (1997), an

GOVERNMENT SUPPORT The Indian Government has agreed to assist and subsidise the setting-up of amateur radio centres

along the Indian coastline to assist if necessary in a disaster and to fit into the countries Natural Disaster Master Plan. They hope to increase this support throughout the country. Praise must be given to this Government for their recognition of the part well-trained volunteer operators can play in emergency communications if the need arises.

STPETER 1 ISLAND
It is believed that Bob KDZP has been given licence approval for operation from this island in

licence approval for operation from this island in December. He now awaits landing permission from the Norwegian Foreign Department. Cross fingers and calculate your beam headings, this could be a good one! He also hopes to

make the same trip next year.

WILLIS ISLAND

This island is not far from mainland Australia, but

has been rather remote with communications for the Meteorological Station staff, when they have had to pass their weather observations back to the mainland. Not now, as new telephone circuits have been

Installed that will be relayed by Australia's own AUSSAT satellite. This system is known as ITERRA (an aboriginal word meaning 'be quick'). ITERRA will link the island with voice and data access to anywhere in Australia via Telecom's switched telephone system.

MOHELI ISLAND A new one for the too-hard-basket probably, 5l0A

was expected to be operational from this island in July.

The island is located in the Mozambique Channel.

According to research, it is apparently a part of the Comoros group, but it is calimed by Tanzania, thus the 51 prefix which is within their allocation and it could be a possible for being in excess of the 250 mile radius as I aid down by the ARRIL DXCC Rules.

It is one of those that we will have to work first

and worry later about because the examination of claims and relative paperwork as to the authenticity of the Italian operators allocation of a call sign, could take a considerable time.

PRIBILOF ISLANDS It is unfortunate to report that the issue of the

In is initiative to report until the isset of the Pribildo Islands is causing some harsh words to be written by Dan Robbins KL7Y, President of the Alaskan DX Association, (ADXA).

In 1983, the AXDA requested the ARRL to add this island group to the DXCC Countries List by virtue of point 2 of Countries List Criteria. After

virtue of point 2 of Countries List Criteria. After two years, the DX-Advisory Committee voted for an acceptance of these islands as a new country. Unfortunately, the Awards Committee of the AFRI. Were persuaded not to add this to the DXCC list. There seems to be no rhyme nor reason to the

non-allowance considering the Advisory Committee's advice. Why have a volunteer committee and not take their advice? In other words, it is a waste of time for all parties concerned, particularly when volunteer labour is getting harder to come by. Space does not permit the full context of Don's

letter to be reprinted but could it could be another 4U1VIC debacle repeating itself. Let us hope not, but hold onto those Pribliof cards in the interin, if you were lucky enough to make the grade with an entry in the log at the time.

CHINA

BYSOH, was due to commence operation on August 20, and BYSHZ is scheduled to send Rifup the coaxial cable this month. At the time of writing these notes, unfortunately no CSL information is available but if is nice to see more by stations participating in the horbly BY4AOM, is small to be a send of the commence of th

receiving much assistance from Tom Wong VETBC, the person, who in my opinion deserves complete recognition for getting BY back on the air. Tom still makes regular trips to China.

BY4AOM is ORV on both 20 and 15 metres, frequently looking for VK stations.

Any amateurs visiting China are made most welcome as guest operators at many of the amateur radio stations such as, BY1PK, BY4AA, BY4AOM, BY4RA, BY4RB, etc.

BYALOM, BYAHA, BYAHB, etc.
Further information may be obtained by sending three IRCs and a self-addressed envelope to Bob Winn, Editor, ORZ DX, PO Box 834072, Richardson, Texas, 75083. USA, Endorse the envelope. "BY Station Information."

AMATEUR RADIO October 1986 - Page 37

UNUSUAL PREFIXES

You were not hearing things as SJ9WL and LGSLG were legitimate CW and SSB calls being aired by the Norweglan Handicapped Radio Amateur Club (NIHRAH). They were operational from Morokulien in July

UNICEF

The UNICEF 'gang' planned an operation from Godavari, in Nepal, using the call sign of Father Moran 9N1MM. The operation was to be during the first week of August. Please do not QSL to Moran or his Manager on this one but direct or via the bureau to the operators instructions.

AMOEFF

Another new prefix and suffix was due to aired from August 4- 15, to commemorate the entry of Spain into the ECC. Special cells from various parts of Europe with special QSL cards were scheduled as follows:

4h — Madrid, 5th — Paris, 6th — Lisbon, 7th — Brussels, 8th — Lusenburg, 9th — Rome, 10th — Brussels, 8th — Lusenburg, 9th — Rome, 10th —

Brussess, 8th — Luxerhourg, 9th — Horne, 10th — Bonn, 11th — London*, 12th — The Hague, 13th — Athens 14th — Dublin and 15th — Copenhagen. OSLs to be sent to EEE, PO Box 2071 cp. 50080

Zaragoza, Spain Zallaguza, Spain.

* At the time of preparing these notes, the UK licensing authority had no knowledge of any operation and therefore it would appear to be illegal in the UK. The status of other countries is unknown. the UK. The status of other countries is unknown. Another case of wait and see. Late unconfirmed news is that a UK licence would not be allowed.

CARDS RECEIVED

we VK2PS, has not had much time to operate Stew NKZPS, has not had much time to operate of late. However his collection of cards is growing, mainly from using the VI prefix. Some of the cards received are SWIEL, eYSMS, 8,1335T (The 100H Anniversary of Japan Standard Time), 8S7BSJ (Boy Socul Jamborce in Japan), HIFYH, JTBH, LZMTS, OESBGI, VETEXPO, VOICA, VIBTC, VSAD, VSBOX, TVSAD, VSBOX, TVSAD, VSBOX, TVSAD, VSBOX, TVSBOX, TVSBOX,

MOUNT ATHOS AGAIN Well known DXers, I0DUD, I0IJ, I0ER and I0GPY

week known Divers, 10000, 1001, inch aim con-attempted to activate the much wanted and discussed Mount Athos country last month. They had more than adequate equipment organised and were progressing favourably with the Greek authorities until the local society apparently authorities until the local society apparently objected and the whole project was aborted. Incidentally, there seems to be compared on the control of the co

ARRL hands and there should be an answer soon Apparently it is fairly similar to previous expeditions paper warfare but it is a case of wait and see. Not an unusual occurrence for the DXerl

BITS AND PIECES The 4U1VIC controversy is still on the boil

Martti OH2BH, was active from the new QTH of Mike 5B4Ti, for the European CW Contest. 802, is a special prefix for the 20th Anniversary of Botswana's Independence and will be used until the end of this month. ** Gerben PAGAM, was operational from the Sudan last month, using the station at the Youth Palace — 6T2YP * XUISS. view. The train of the property of the propert emphasis being on an anti-social and anti-national theme. It is possible that this film may be released in other countries including VK, under another title. ** Four French operators hoped to

activate Clipperton towards the end of last month, whilst en route from San Francisco to Acapulco, na French Naval vessel. "* Have you heard P5AGJ? He is giving his QTH as PO Box 1216, Heungman, North Korea. Another question—It he genuluse? If the paperwork is correct it could be

Heungman, North Korea. Another question — is negative? If the preparent's correct i could be to graupe? If the preparent's correct i could be may be appropriate if a few avid DXvs track him and the preparent is considered in the preparent in the Batic Sea.

QSL AND QTH NOTE

Every effort is made to check the authenticity and correctness of addresses and QSL managers published in Amateur Radio but it is emphasised that the magazine or the writer cannot be held responsible for incorrect addresses, wrong managers or non return of cards.

OTHS YOU MAY NEED

3C0A TROA, PO Box 1826, Libreville, 4V2RM PO Box 1419. Port Au Prince, Haiti. 4X5. PO Box 4099, Jerusalem, Israel. TUZNP PO Box 1518, Abidian 01. 5RBJD 5VZ.LI

TUZNIP PO Box 1518, Abidjan 01, lvory Coast.
PO Box 30, Niamfusgou, Toga.
PO Box 84, Apis, Western Samoa.
PO Box 84, Apis, Western Samoa.
PO Box 93/270, Nairobi, Kenya.
PO Box 48, Kharboum South.
F8EYS, 8 Rue du General Ganeval,
F91290 Strasbourg Ville, France.
KARV, 83787 Dorsey Lane, Junction
City, OR 97448, USA.
PO Box 1553, Nuku/Alofa, Tonga,
Sruth Pogliči. 5W1FT 5Z4DD 6T2MG 8P6GI

City Or Brees, oxidation and the Company of the Com A35SA AAVOS BY457 C30C

DV7CE EKRA FOOASI

HH9E HP8RHT J28DQ J87CD

J88AC

KP2AH SV5OX SV5TX SX1MB

ICAT

YASME

YK1AO XT2BR

Rus 5 de Julho, Praís, Républic O Cape Verda. PO Box 238, Bacolad City, Philippine Islands, 8003. Tolheran, Iran. PO Box 3954, Noumas, New Caledonia, South Pacific. NSDD, 3008 SouthWestern Boulevard, Dalliss, TX 75225, USA. PO Box 243, Port Liberte, Halli. PO Box 804, Aquadide, Pinamam. PO Box 875, St Vincent, Windward Islands.

Islands. PO Box 142, St Vincent, Windward

Islands.
PO Box 146, Cambridge, England.
KH6JEB, 95-161 Kauopae PI, Miliani
Town, HI 9679, USA.
WAZYMX, 3465 Carrolton Avenue,
Wantagh, NY 11793, USA.
6 Ebony Street, Umtata, Transkei
PO Box 251, Rhodes Island.
PO Box 251, Rhodes Island.
RAAG, PO Box 3584, GR-102 00, JY8NT KH6JEB/KH7

Alhens, Greece. Ustun, SOK 11, Ayranci, Ankara.

Osluti, SON 11, Ayranu, Alinas, Turkey, PO Box 119, Puntarenas, Costa Rica. • PA0ZBL, Vissersdijk 13, NL-3319 GT Dordrecht, Netherlands, PO Box 852, Belize City, N4GNR, PO Box 433, Toccoa, GA 30577, USA. V3EE VQ9ZZ

PO Box 73, Edgemont, PA 19028, **W3HNK** USA PO Box 5127, Suffolk, VA 23435. W4FRU PO Box 8, Pago Pago, American Samoa, 96799 USA. WHBAAP

PO Box 2025, Castro Valley, CA PO Box 245, Damascus, Syria F6FNU, 7 Res du Val, Ollainvil F91290 Arpajon, France.

YM3KA ZC4AP ZK1AI PO Box 937, Izmir, Turkey. JSB, BFPO 53, London, England. PO Box 90, Raratonga, Cook Islands. PO Box 90, Haratonge, Commun. South Pacific. VK2BCH, PO Box 344, Forster, 2428, ZK1XV

OSL TO

Handsteinhold, 1920. ACRES 100 Profile (1) September 100 Profile (1) S

 OSL NOTES: (1) SM2EKM is still the Manager for SM2DI S2 (1974). Cards are still available and it is valid for DXCC. (2) VE3EWY, is still the Manager for VP2KU (SI Kitts 1972). Cards are still available. MACAU - THE FUTURE?

The future of XX9, formerly CR9, with a population exceeding 400 000, is at stake

The 15.5 square kilometre tourist area, likened The 15.5 square kilometre tourist area, likehed to Monaco because of list casinos and easy way of life, is dependent on its neighbours, and most particularly Hong Kong, some 60 kilometres away, so much so that its currency, the Pataca is 'tied' to the Hong Kong Dollar for tourist trade and massive investment

Macau, unlike Britain's lease of Hong Kong Macau, unlike Britain's lease of Hong Kong which expires in 1997, has been under Portuguese rule since the 16th century when the Chinese, according to the Portuguese authorities, granted them title to the area in 1557, however any documentation has been purposely mislaid or just lost, if it did exist.

In 1976, the Portuguese government of the day agreed to release the area to China, but have still carried on their rule as before. However, in the carried on their rule as before. However, in the 1984 general election eight Chinese out of the 17 member Legislative Assembly were elected. Maybe this is not surprising as some 95 percent of Macau's stable population are ethnic Chinese, with the balance being Portuguese and

It is interesting to note that, although the legal system and official language is Portuguese, most of the inhabitants speak Cantonese.

A meeting in July between the two interested countries achieved very little and it is hopeful that talks scheduled to be held in Peking last month may have been fruitful in resolving a smooth

may have been fruitful in resolving a smooth transition for the populace. Undoubtedly, there will be a change of owner-ship and another prefix will be issued to delight the prefix hunters but how will the new adminis-trators resign themselves to casinos, trottly tracks, and other attractions which is not part of their lifestyle

It is felt that it will be a wait and see situation, depending mainly on economics and as to how it affects the neighbouring populace.

THANKS incere thanks are extended to the following:

The Editors of weekly, biweekly and monthly newsletlers including the ARRL NEWSLETTER, BARG, COJGO, DX ARMY FOUNDATION NEWSLETTER, INSIDE DX, JAN and JAY O'BRIEN'S OS. MANAGER LIST, KHBEZF REPORTS, OR STANDARD SHALLER, NEWSLETTER, NEW

Magazines including, BREAK IN, cq0X, DX POST, JA CQ, JARL NEWS, KARL NEWS, QST, POLICE LIFE, RADCOM, VERON, WEATHER NEWS and WORLDRADIO.

Members who have contributed include VKs 1WB, 2PS, EBX, 3PC, YL, L30042 and VK6NE. Sincere thanks to one and all who have made this months column possible.

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CS-401, 4 pos, coax switch. CS-4 apos, coax switch. CS-4016, 4 pos, coax switch. CS-2016, 2 pos, coax switch. CN-620A, SWR/Power meter. CN-520, SWR/Power meter. CN-540, SWR/Power meter. CN-410M, SWR/Power meter. WELTZ

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PORCELAIM ANTENNA INSULATORS Egg \$1.00 : Dog-Bone \$1.50 Super large Egg for long-long wire — Rh bics & Guide Wires — \$200 COAX, SAXON MIL, SPECS RG - 213 in stock - \$3,50/m 8 CORE HEAVY DUTY ROTATOR Cable \$2.50/m

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Daiwa PS 120M 12A (10A Cont.) POA

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HI-120U, 70cm, 100W, GaAS F H-60U, 70cm, 60W, GaAS FET 100W, GaAS FET H-725D, 2m/70cm H-160V25, 160W, 2m HL-85, 85W, GaAS FET, 2m HL-66V 6m, 60W LA-2155E 2m 150W

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PACKET REVOLUTION PK-64 & PK-80 \$760 \$515

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any ASCII Terminal or PC and Standard Terminal Software. HAL CT 2200 & KB2100 Interested in CW-RTTY-HSC11 mode of communications? This

RX/TX HAL system is all you'll ever need. Write for more Tech, Info. Reg. Price \$1790 Special \$1190 VIC STORE: 288-294 Queen St, Melbourne, Vic.



NSW STORE & HEAD OFFICE: 92-94 Wentworth Ave, Sydney, NSW. 2000 211 0988, TELEX: AA 73990

Ph: (03) 67 8551 or 67 8131 Correspondence & Mail Orders: Box K\$1, Haymarket, NSW, \$000



Spotlight on SWLing

Robin Harwood VK7RH 52 Connaught Crescent, West Launceston, Tas.

As you have probably noticed, there is a new address under the Masthead. I am now living in the western suburbs of Launceston. Although I am writing this six weeks before moving into the new QTH, preliminary indications are that it should be satisfactory.

Conditions of late have improved, although the QRM on the lower frequencies, particularly notice-able in summer months, is starting to be heard. Fortunately, conditions on the higher frequencies will improve to make up for the tropical bands being too noisy. I also suspect that we have emerged from the bottom of the Sunspot Cycle, as a number of spots visible on the Sun's surface, are slowly increasing.

BUSY, BUSY, BUSY!

This month of October is a busy one for the amateur, Firstly, the annual VK/ZL Contest, with the Phone Section on the 4th and 5th and the CW the Phone Section on the 4th and 5th and the CW Section, one week later. On the 18th and 19th we have the annual JOTA participation. This year, because I will be away on my honeymoon, I will not be participating as VKTRH/P. It will be my first break from JOTA since 1973.

CHANGING THE TIME

At the end of this month, we see the re-introduction of Summer Time in VK2, 3, 5, and 7. This corresponds to the end of Daylight Saving Time in the States on the same day. DST ends officially in the UK on the 19th. Those interested in trying to get those elusive Brazilian DX catches, note that Summer Time was also introduced there as an energy conservation measure November. They may do it again this month!

COLLECTORS PIECES

I recently received details from William Perleberg L70043, of "Sunrise Gardens", Fern Tree, Tas. 7101, concerning details of Radio Beijing utilising a French Guiana relay for their programming to North America. The Montsinery site of Radio France Internationale was reportedly using 11.980 15.230, and 15.445 MHz at 0300 UTC. Also, RF

was able to utilise Chinese HF transmitters as a consequence of the trial reciprocal broadcasting agreement. If you wish to hear these broadcasts w, you are too late as the new French Government, under M. Jacques Chirac, was unable to reach agreement on continuing these reciprocal privileges.

If you are lucky enough to obtain QSLs for RB, via Montsinery or RFI via China, hang on to them as they will be collectors items. France is reportedly going to construct relay facilities in Sri Lanka. These are going to be in the southern part of the island nation, well away from the troubles of the north, which have plagued the Deutsche Welle site at Trincomalee

FURTHER TO ...

Whilst we are on reciprocal agreements, yet another Asian broadcaster recently signed an agreement to utilise transmitter sites in North America. Radio Japan and Radio Canada International will exchange programs over each others senders. At the present time, I am aware that Radio Japan (NHK) will commence relaying from the Sackville site in October or November, to relay their North American programming. The Sackville site is also used by the BBC and DW to relav programming to the same target areas.

HOT WATER Presumably RCI will use the NHK facilities to beam programs to Asia. Until recently, this area

has been largely neglected by Canada. They commenced producing a Japanese commercial program, which is aired via Radio Tanpa, the Japanese commercial shortwave broadcaster, on a weekly basis. Also, a Chinese language program and English/ French information has been aired over cable

systems in Hong Kong occasionally. Both, I believe were produced in Vancouver, BC. Incidentally, RCI got onto a little hot water with its US audience following plans to axe releases to the US. The reaction to this Budget Saving measure has taken RCI by surprise. Apparently, there are more listeners in the US than they thought!

WATCHING THEIR Ps and Qs?

Looking at the August issue of Monitoring Times which is published by Bob Grove, a well-known DXer, I see that the Bills in the US Congress are rapidly speeding towards ratification in the Senate. It aims to prevent casual radio listeners from intercepting mobile phone calls or remote broad-cast links. If the Bill becomes law, an SWL could face up to a year in a Federal Prison and a US\$10 000 fine, if convicted of violating the Communications Privacy Act.

Communications Privacy Act.
This Bill is designed to protect the privacy of Mobile Cellular Phone Systems which operate around 800 MHz. Many hobby groups are fighting provisions in the Bill which will restrict their monitoring activities in the legally-recovable spectrum. They suggest that instead, cellular system owners develop and install electronic or system owners develop and install electronic or digital encoding to enhance the privacy of phone calls. It was unfortunate that one scanner manufacturer advertised the fact that his models were able to intercept the Cellular Mobile Frequencies. This made the US legislators angry and eager to enact the Bill. The company subsequently withdrew the offending advertisement. At deadline time, it is still unclear if the Bill has become law in the US. I will keep you informed.

I also note that cordless phones are continuing to be a problem. Recently, American police dispatchers began to receive calls from "phantom dialers" who locked up the police switchboards. It soon transpired that, when the batteries on a cordless phone get weak, they are susceptible to pulses from household electronic appliances such as microwave ovens, etc. They then begin dialing random digits, usually 911, which happens to be the emergency phone number over there.

I wonder if similar problems have been encoun

tered here? I have certainly experienced problems from second, third or fifth harmonics from them falling within the 80, 40, and 30 metre amateur bands, often landing on a weak DX signal. Well, that's all for October, Until next time, the best of 73 and good listening

-Robin VK7RH



Education Notes

Statistics for the May examinations were received recently. It was very pleasing to see that the Novice pass rate was again up to where it was

some time ago. For the interest of those keeping track of such matters, I present a summary of the theory results and some comments.

| VK | | AOCP | N. | AOCP |
|-----|----------------------|--------|----------------------|--------|
| | SAT | % PASS | SAT | % PASS |
| 1 | 6 | 50 | 3 | 33.3 |
| 2 | 75 | 37.3 | 64 | 67.2 |
| 3 | 73 | 28.8 | 64 50 29 19 | 50 |
| 4 | 56 | 35.7 | 29 | 65.5 |
| 5/8 | 73 56 24 37 | 16.7 | 19 | 26.3 |
| 6 | 37 | 29.7 | 25 | 52 |
| 7 | 2 | 0 | 8 | 50 |
| TOT | A- 272 | 32 | 198 | 55.5 |

The AOCP pass rate is still low, however. Page 40 - AMATEUR RADIO, October 1986

It becomes more interesting when we look a in terms of the examination papers used. For Victoria and New South Wales, three papers were used, one for each capital city and the other for the country centres, so it is difficult to compare their results on a state basis. However, the AOCP paper used for the country centres was also used for all the examinations in both Queensland and South Australia/Northern Territory, resulting in widely differing pass rates at both levels.
This suggests that there is a "Quality of Student" factor, but for the regulations examin-

ation, VK5/8 had 58.3 percent pass to 41.4 percent Is there a statistician in the house?

The variations between examinations by state are often greater than the variations between states for the same examination. Unfortunately, I do not have time or background to go into much depth in these analyses, but if any reader wishes to go further, I would be very interested.

aders may have noticed that we do not have a sample examination paper this month.

Brenda Edmonds VK3KT FEDERAL EDUCATION OFFICER 56 Baden Powell Drive, Frankston, Vic. 3199

Most of the papers that have been prepared over the years have now been published. I intend to start producing some more, but have not had a lot of feedback on whether or not the regular publication should be continued. I would appreciate comments on this, and I would be more than pleased to receive questions which could be used in sample papers.

-73 Brenda VK3KT

AMENDED JOTA

CALLING FREQUENCIES FOR AUSTRALIA

80 metres — 3.590; 40 metres — 7.090, 20 metres — 14.190; 15 metres — 21.190; 10 metres — 28.990 MHz. Remember JOTA is on the 18th

and 19th of this month. Please participate!



TECHNICAL MAILBOX 🐲



Many readers would have read the letter from Albert VK6ARD, of Cottesloe, Western Australia. in last month's Over to You!. Albert suggested that AR "devote snace to a section of our excellent

magazine to a Question and Answer session."

Well Albert, we have done just that! Your lette gives heart to us that we were not alone in the idea.

idea. To Albert's suggestion of the best way of cutting "foam plastic", one further suggestion — for safety reasons, I suggest that this is a job to be undertaken only when your wife is out shopunderta ping!!!

Now, in reply to your questions, Albert......Albert asked why his power supply zener diode and fuse blows regularly when powering his two metre, 25 watt transceiver. The power supply

two metre, 25 watt transceiver. The power supply is rated at 6-8 amps. Boy! This is somewhat difficult to answer without a circuit and component list! Write us again Albert and I am sure we can provide the answer.

In the meantime, study the circuit and check the

component ratings. If it is a simple shunt, zener regulated supply, measure the zener current. Is it within its rating? (viz dissipation too high?). You would not be the first to be an owner of a commercially engineered "bomb."

Maybe, as you specifically mention two metres, it could be a function of the RF from the

ransceiver somehow finding its way across the zener. Perhaps inadequate earthing, high SWR or a quarter wavelength multiple DC supply lead has a bearing on your problem. If this is so, then RF

bypass the zener, improve your earthing and SWR or use a shielded cable for the DC power feed, consider the provided provided the provided provided the provided prov

changes to effect the remedy.

As a sideline, it was once said of one manufacturer that, after the design engineers completed the prototype unit, the "sales engineers" moved in. They commenced removing each component (individually). Finally, with a box full of "redundant spares" and after the unit failed, that the last spares and after the unit failed, that the last component was then replaced to provide the production-line model! Perhaps things have not changed very much with modern trends, regardless of the drop in minor component prices?

Albert also asked why "it is necessary to have, in an ATU, a variable capacitor in series as well as

in parallel?"
I cannot figure out just what configuration you are referring to in this case. Sorry Albert, but further information is necessary on this one

VK2 . . ., of Epping, New South Wales, writes of problems he has experienced on 14 MHz with ncessant breakers coming in from North American stations, whilst working across Aus-

Normally this column addresses only "technical matters" however, perhaps we can see our way clear to add a paragraph or two on operating

Since the "American Phone Band" has been extended down to 14.150 MHz, it has at times become fairly crowded. In some cases it is not always possible to choose a lower band to chat to your long-time friend and thus you are faced with erating on a "DX-Band

It is always best to contain oneself when breaking in on a QSO. Some do just that — breakin. Remember to listen and find out what the etations are talking about and then only if appropriate knock gently and wait to be invited into the QSO. Don't crash right in. If two operators are engressed in a technical discussion or are talking of matters which are of little common interest to you, don't crash the door in just to get a report on your latest shack change. Don't be lazy! Find a clear channel and call for a report. You will normally get a response.

normally get a response.

Now back to your original problem — the Now back to your original problem— probably last finished potting up that we have been been probably last finished potting up that we have the sent bean at 40 metres, receiving your 100 watts at 58 + 20 and wants to know if his 2 kW can get to "down under." Cuery the breaker, then respond to a "mobile station" in the breaker's call area. Ignore him Compliment the mobile station on his 9 + signal from his two metre whip, etc. After this QSO, go back to the breaker. Take a couple of overs to get his call sign and another couple to get his name and a R3 S3 should seal the situation! He will disappear to look for the "problem" and allow you to continue your OSOI!!



Australian Ledies Amateur Radio Association

ALARA BIRTHDAY YL ACTIVITY DAY Our Birthday YL Activity Day on July 26, was very pleasant and we were able to catch up with several DX members, mainly Canadian, American

and New Zealand YLs.
Several "semi-nets" formed, and we had the opportunity to chat to some of the girls we had not heard from in a long time, plus meeting others for

Unfortunately, propagation was not all that good, very little being heard on 10 or 15 metres. The main DX activity was on 20 metres, with VK and some ZL activity on 80 metres later in the day.

I heard no European stations at all, which was very disappointing. It would be interesting to know if anyone did have a European YL contact during the course of our Activity Day

Although not too many ALARA members were almough not too many ALAHA members were able to participate in our special birthday celebration, those who did had a most enjoyable time; so much so that we are seriously considering another such Activity Day for our next birthday.

ALARA CONTEST With the ALARA Contest just around the corner, it

may by an opportune time to remind everyone about the special trophy to be awarded for the highest aggregate score over five years of a licensed YL operator (not necessarily Australian). The year of commencement was 1983.

Our Contest Manager, Marlene VK2KFQ, has

compiled a progress report to remind us all that the five-year trophy award is still running, just in case any of us might have forgotten. Here are some of the aggregate scores so far

CW operators do have an advantage when it

pleaset

Elizabeth VE7YL Poppy VK6YF Joyce VK2DIX Pearl ZL2QY

CW operators do have an advantage when it comes to scoring, because all points are doubled for CW contacts. Novice YLs have the additional award to compete for — the Florence McKenzie CW Trophy. Two very good reasons for getting those CW keys dusted down and into operation, ladies.

ACTIVITIES

A very pleasant ALARA Birthday Get-Together was organised by Meg VK5AOV, for VK5 members, beginning with a smorgasbord lunch at the Belaire Hotel and concluding at the QTH of Joy VK5YJ, for afternoon tea. A most enjoyable time was had by all, even if it did leave them all feeling somewhat 'fed-up.' (All that food creates havoc with diets).

The VK3 girls attended a luncheon to celebrate ALARA's birthday, and enjoyed a delicious meal. There was probably as much talking as eating. and the function was pronounced very successful and enjoyable. Plans are afoot for another luncheon next year.

(After writing this I am beginning to feel a bit hungary myself — excuse me while I go and make a sandwich). Congratulations to Maria VK5BMT, who has achieved the South Australian Jubilee 150 Award

on vrif.

Congratulations of a different sort to our
Contest Manager, Mariene VK2KFQ, and her OM
Ron VK2EFJ, whose little harmonic, Kate Laura Ron VKZEIJ, whose ittle narringer, rate began was born on July 2.

There were 15 ALARA members, including Celia ZL1ALK, joined into the ALARA Birthday Net on July 28. Outle a good attendance on such a cold, bleak, curl-up-by-the-fire sort of night. PUBLICITY OFFICER, ALARA Box 22. Yeoval, NSW, 2868

Joy Collis VK2EBX

JOTA This is Jamboree-on-the-Air month, JOTA being Ins is Jambore-on-the-Air month, JOTA being held on Saturday, October 18 and Sunday, October 19. Many ALARA members involve enjoyed by Scouts, Guides and amateur radio operators alike. If you have never tried JOTA and would like to participate this year, contact your local Guide or Scout Troop or your WIA Divisional Office.

NEW MEMBERS Additions to the membership list (July AR)

VK3 Associate member — Margaret Hamilton, July 20, 1986. Angle GOCCI, February 25, 1986.
Welcome to Margaret and Angle.
—Until next month, 73/33, Joy VK2EBX

NICAD HAS OWN SOLAR PANEL The SN 2000 is a NiCad battery with a built-in solar panel

This D-size NiCad supplies a full capacity of 1.2 volts at 1.2

amp nours.

In full sunlight conditions, it charges at half the normal recommended wall plug charge rate, or where mains power is available it can be charged in the normal manner. Parallel or series solar charging is possible because

each cell charges individually, and with the use of protection devices during discharge, offers the option of building solar systems of almost any voltage or amp hour current sour systems of almost any voltage or amp hour rating using these single cell MCads.

Impact and weather resistant, with good high-viced temperature performance and a service life that exceeds IEC 285, the SN 2000 is suitable for any application requiring reliable power.

From Dectronic Names, July 1966

AMATEUR RADIO, October 1986 - Page 41

RESULTS of the 1985 VK /ZL/O

CONTEST

Greg Williams VK3BGW
WIA VK/ZL/O CONTEST MANAGER 1 Noorabil Court, Greensborough, Vic. 3088

IADAN

JATYFB JESMQW JHTWKQ

OVERSEAS PARTICIPANTS

These are the DX results for the 1985 VK/ZL/O These are the DX results for the 1965 VNZL/O Contest. As mentioned previously, the conditions for the Phone weekend were terrible and slightly better for the CW Contest. The standard of logs was very high and I thank

all those who took the time to enter a log.

The purpose of this contest is for VK/ZL and Oceania stations to contact DX stations around the world and this would not be possible if DX

station did not participate. station did not participate.

Call signs printed in **bold type** will receive an award and these will be posted shortly.

As this is my last VK/ZL/O Contest as Manager I

want to thank all those who have helped me, and in particular. Jock White ZL2GX, the NZART Awards Manager, who will be doing the work for the 1986 Contest. So, remember to send your log to him at 152 Lytton Road, Gisborne, New Zealand.

MODE - PHONE

| EUROPE | | | | | JAPAN | |
|---------------|--------|-------|----------------|-----------|---------|--|
| CALL | BANDS | CORE | CALL | BANDSCORE | | |
| OH7AB | • | 3232 | JE6MQW | • | 33698 | |
| HRRADD | | 2736 | JA7YFB | | 30243 | |
| CT4NH | | 2470 | JASYBA | | 12980 | |
| HA7KLG | | 2016 | JA2BNN | | 9504 | |
| DJ3HJ | | 2016 | JH7LRS | | 5760 | |
| HABNP | | 1950 | JATYCO | | 5544 | |
| SP5PBE | | 1547 | JASBIE | | 4290 | |
| 72KIM | | 705 | JAIRZN | | 3950 | |
| HBOIK | | 700 | JE21EQ | | 3162 | |
| G3KSH | | 408 | JAQUER | | 3100 | |
| LZ2JE | | 192 | JA2YDC | | 2754 | |
| IV3YYK | | 98 | JRABOT | | 2268 | |
| YO3DC | | 96 | JRIZTT | | 1240 | |
| SP6CIK | | 84 | JA4YPE | | 1092 | |
| SP6JZB | | 84 | JIIWLL | | 1040 | |
| YOSHT | 40 | 80 | JAIAAT | | 546 | |
| HA4KYN | 20 | 238 | JA1BUI | | 504 | |
| CHAILI | 20 | 160 | JH3DEJ | | 192 | |
| PANDUC | 20 | 126 | JE3CEC | 40 | 4 | |
| PANZH | 20 | 90 | JA1BNW | 20 | 160 | |
| SPSKVW | 20 | 45 | JA4GXS | 20 | 70 | |
| OLDV AAA | 20 | 40 | JAZFAS | 20 | 40 | |
| | | | JA10YB | 20 | - 4 | |
| | | | JA9ZGZ | 10 | 2 | |
| NORTH AM | IERICA | | | | OCEANIA | |
| WOKEA | • | 10710 | KA3DRR /DV2 | • | 297440 | |
| | | | | | OTHER | |
| W2FCR | | 286 | HL1APR | | 1728 | |
| K6UO | • | 180 | | | | |
| USSR | | | | | | |
| UWOME | | 12760 | LIMOMWO | | 468 | |
| UAOLCZ | | 12376 | UT4UWK | | 280 | |
| UHREA | | 11592 | URIRWX | | 180 | |
| UASYX | | 10580 | RR5QQ | | 152 | |
| UADSALI | | 7488 | UPIRWO | | 144 | |

| RL8PYL UM8MO UP1BZZ UZ9UZT UZ0LWG UL8LWZ UZ4FWO UL8LWA UB3IWA | 2120 1729 1320 1232 1080 988 740 550 | UZ9CWD UZ4WWB UZ3TWT UL7LW RR2RU UA3TG UZ9CYP | 20 20 20 20 20 20 20 20 20 | 480 468 340 320 72 50 12 12 |
|---|--|--|--|--|
| SWL - AL | L MODE | | | |
| VK J HAGAN UP2 038 158 JAO KAMAG, UAD 198 505 UBS 068 23 UAE 150 787 UDS 001 220 WIA L30371 | 9792 Al 5364 3904 2714 1425 1320 1176 540 | OK3 13095 UT5 187 1 NL 8992 R33 UT5 186 100 UA3 137 968 ONL 383 OK1 11881 FE 3060 | : | 528 321 320 280 276 54 40 26 |
| HA4XX, UA3DJS. | | ZRX, SME | KMD, | ck logs — SM6OOI, ZL2BGO, |
| CALL | BANDSCORE | CALL | BAND | SCORE |
| SM4CMG HA7KLG HB9CJG HB9IK LZ2KIM OK1VD SPSPBE OH1TN DL1SV OK1MAW OH5PT OK2BSG OK2BSG OK2BSG OK2BSG OK2BSG OK3CSH OH3JF EA2IA YO8DDP SP8CIK EA1AUI | * 3565 * 2736 * 2300 * 1764 * 1581 * 1440 * 1377 * 1140 * 884 * 882 * 220 * 230 * 240 * 250 * | GSMY EASCR PISPVI EASCLO EASCKP LZ2HK EA7XC LZ2JE OK1KOK PA3BHS OH9PN HASLZ OE1TKW OK2BWZ OK2BWZ | 40 40 40 40 20 20 20 20 20 20 20 20 20 20 20 20 20 | 84 75 72 72 70 48 132 60 30 12 48 48 40 40 36 30 18 8 |

| JAODAI | • | 9400 | JAZUOT | | 504 |
|----------|---|--------------|-----------------|----|------|
| JR1ZTT | | 8400 | JAIAAT | | 468 |
| JA5EGX | | 8280 | ARYRAL | | 336 |
| JR3BOT | | 8148 | JA7FAS | | 336 |
| JA6BIF | | 7426 | JA7KM | | 32 |
| JR1IOS/4 | | 4410 | JA3YBF | 40 | 1036 |
| JA2PSV | | 4032 | JR4SRW | 20 | 630 |
| JJ3JJL | | 3990 | JA2KPV | 20 | 616 |
| JASGU | | 3422 | JOIOZI | 20 | 418 |
| JATYCO | | 3016 | JK1LUY | 20 | 320 |
| JAZYMA | | 2900 | JH3DEJ | 20 | 90 |
| JARSW | | 2704 | JAIVZM | 20 | 64 |
| JATYAD | | 2500 | JE2MDE | 20 | 50 |
| JBBOJZ | | 2184 | JAIBNW | 20 | 48 |
| JA2DN | | 2070 | JACURR | 20 | 36 |
| JAIRUN | | 1120 | JAIOYB | 20 | 30 |
| JAJARM | | 1080 | JAIYAG | 15 | 100 |
| JATYFH | | 930 | JG3SVP | 15 | 12 |
| | | 930 | JUSSVP | 15 | 12 |
| USSR | | | | | |
| UZOFWA | | 13440 | UR1RWX | | 621 |
| UZOCWA | | 12295 | UA4HNP | | 588 |
| UAOSAU | | 11340 | UT4HWK | | 572 |
| UWOLT | | 11340 | UJRJA | | 442 |
| UZOCWO | | 8400 | UBSTN | | 400 |
| UZDOWA | | 8190 | BB2BW | | 352 |
| RAOFA | | 7740 | UR2RND | | 320 |
| UZOLWX | | 7538 | UZ1TWB | | 300 |
| UP1BZZ | | 6634 | UBOIBC | | 286 |
| UAGOO | | 6240 | UQ2GA | | 274 |
| UZOCWW | | 6160 | UASCR | | 216 |
| UHBEA | | 4896 | RL7GA | | 198 |
| URAYWR | | 3920 | UA3XBB | | 176 |
| UZOLWG | | | | | |
| UA4RZ | 0 | 3654 3630 | UP2OU UI9BWI | : | 154 |
| | | 3630 | DIARMI | | 96 |
| UA0ZPB | | 2929 | UD6CN | | 84 |
| UZIAWI | : | 2496 | UT5UGR | : | 72 |
| UA9NN | : | 2200 | UA6YCI | | 70 |
| UB4IZZ | | 1980 | RZ3AM | | 60 |
| RR2RU | | 1980 | UBSIFN | 40 | 140 |
| UQ1GWW | : | 1800 | UF6FAL | 40 | 24 |
| RL8PYL | | 1480 | RW3AN | 40 | 24 |
| UZ3AXH | | 1254 | UBSIJA | 20 | 462 |
| URBAWX | • | 1200 | UASTCJ | 20 | 442 |
| UH9EWA | • | 1152 | RASVM | 20 | 380 |
| UASLDF | | 1120 | UAOLT | 20 | 320 |
| UASAF | | 1071 | UA4LBF | 20 | 231 |
| RT4UA | | 1002 | UASLFQ | 20 | 196 |
| UA4WBV | | 992 | UWSOE | 20 | 154 |
| UP2BIM | | 972 | UQ2GLW | 20 | 96 |
| UZ4WWB | | 952 | UASWYL | 20 | 18 |
| UAGLLT | | 912 | UL7CEP | 20 | 12 |
| UASLCJ | | 896 | UV9WR | 20 | Ä |
| UWOCM | | 832 | UBSVK | 20 | å |
| CHOCH | | 052 | UE ODA | | |

We thank the following stations for their check logs. HAOHIG, OHZEJ, OHSMC, PASBTH, RASVO, RTSUC SMOBOS, SMOOOI, SP2GOW, SP3AOT, SP4JWP SPECIK, UAGABB, UAGLCZ, UAGLDO, IAQZC UAGZDE, UA4HLD, UA4NBH, UA6PCH, UA9AU UHBED, UL7BY, YKSNE, YCGLV. PLEASE NOTE: * denotes worked all bands

Magazine Review Roy Hartkopf VK3AOH 34 Toolangi Road, Alphington, Vic. 3087

G General C Constructional P Practical without detailed constructional information T Theoretical N Novice X Computer Program

RADIO COMMUNICATION, August 1986 -Page 42 - AMATEUR RADIO, October 1986

CO. June 1986 - VHF Special Issue. Classic Keys and Key Collections (G). Using Packet Radio (G). Cheap HB Power Supplies (P: N). Frequency Synthesiser (C). All Band Antenna (P: N). WORLDRADIO, July 1986 - General World Amateur News. Dayton Hamfest. Hazardous Materials. Packet Radio. (G: N). BREAK IN, June 1986 - Diamond Jubilee

8740 KA3DRR

2288 LU1EWL

3600 VC2FFA

NORTH AMERICA

WOKEA

K320

KF1Z KA7T

Conference. QST, May 1986 - RF Measurement. Return Loss Bridge (P).

OCEANIA

164400 12768

OTHERS

use.

HAM RADIO, April 1986 - Grounded Grid Amplifier Parasitics (T : P). Satellite Communication (G : T). AC Line Transient Protection (P)

HAM RADIO, June 1986 — Core Permenality and Current in Windings (T: G: X). Regulated Screen Grid Power Supply (P).

HEAT-SHRINK SLEEVE MARKING A new system has been released for applying permanent marks to heat shrinkable sleeving using standard equipment.

The HSI system uses an irridated polyclefin which is flattened and then bonded to A4 size

paper for marking by the user.

The paper is fed into a standard typewriter and marks can be typed as needed directly onto the marks can be typed as needed directly onto the sleeving, or alternatively marks can be scribed onto the sleeving with the use of a permanent marking pen. Once marked HSI is then cut, removed from the paper by hand and heat shrunk (21 ratio on the cable in the usual wa-

(2:1 ratio) on the cable in the usual way.

Nine widths of sleeves are available from 1.6 to 25.4 mm diameter. The layout of HSI on the sheet allows random selection of marks for rapid ease of

Adapted from Electronics News, p33 - April 1986



International News



TEGA **ELECTRONICS**

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INTERNATIONAL TRAVEL HOST

Following is an additional list of amateurs who are participating in the International Travel Host Exchange Program. (See Initial list page 43. August issue.

Belgium Jean Fagnoul ON1KFN

Canada F H Prouse VE3PEJ, Carlton Sole VE3GHT, Bob Kane VE3KUG, Ross Carr VE6FG, Neil Smith VE6AZA, and William Giesbrecht VE7FRR.

Germany Johannes Amchewicz DK8JB.

Greece Agis Sarakinos SV1ACS.

Harvey Stadick KA0GBJ.

M S D C Radharaman VU2RAD and G D Gooal VU2GDG.

United States of America Dave McCurdy N1DLS, Mr and Mrs Garry Bartels KJ4KM and KB4TGC, Robert Blumberg AA4U, Mr and Mrs Richard Genaille W4UW, G E McGrede NSJDM, Mr and Mrs Ken Hopkins WA9WCP and KA9EFE, Mr and Mrs Karl Pruett WA0NPK, and

HIGHEST MEMBERSHIP IN JAPAN Due to a membership promotion campaign in November and December, last year, the Japanese Amateur Radio League has, as of February 7, 1986, a total of 136 369 members, which is the highest in the history of the League.
—From Region 3 News, April 1986

BOTSWANA'S 20th INDEPENDENCE ANNIVERSARY To celebrate Botswana's 20th Anniversary of Independence, the Botswana Radio Amateurs

have been permitted to use the following Special Event Call Signs, during September and October 1986. Full Licensees will use the prefix 8O2

Novice Licensees will use the prefix 800 BARS members, including SWLs and other Botswana active radio amateurs are being issued with QSL cards Contributed by Gerold Tjarks A22TJ/802FTJ Secretary BARS

FASTEST MOS CHIP!

A new silicon MOS chin, believed to be the fastest practical chip to date has been tested at speeds of up to three gigabits per second — fast enough to use in high speed fibre optic transmission systems

This silicon chip shows that silicon can be used for gigabit-per-second logic circuits, and silicon offers higher yield, lower cost, and higher levels of integration than gallium arsenide.

Most importantly, the circuit consumes little

power.

The multiplexer chip has 200 logic gates and dissipates only half a watt of power whilst the demultiplexer ship has 400 logic gates and dissipates 0.75 watts. Both chips are 2 mm². The chips were designed in 0.75-micron NMOS technology and feature channel lengths as small

as 0.5 mi The multiplexer accepts 12 parallel input channels and, using time-division multiplexing, generates a multi-gigabit-per-second serial output. The de-multiplexer performs the reverse

The propagation delay is only 150 pico- seconds. agation delay in each gate on the chips Abridged from Electronic News, p4 - April 1986

EXCHANGE

The following is a report of a meeting between the Radio Communications Branch of the Dutch PTA. He are considered to the State of the NCV announced that it is in liquidation and will not

FROM HOLLAND

be represented anymore at the half-yearly PTT/ CEPT Licensing

CEPT is the European organisation of PTTs. The Dutch PTT announces that it will introduce simultaneously with the new Dutch licensing system a CEPT licence applicable to the Netherlands. It will be a publication announcing that amateurs from other CEPT countries with recognised licenses will be allowed to operate in the Netherlands for short periods without applying for a Dutch visitors licence. (Grade A, Grade B "full" licenses and Grade C (equal to VK limited

Dutch amateurs will receive a new registration Dutch amateurs will receive a new registration card containing, in several European languages, a declaration indicating the appropriate licence the bearer has been issued with. This document will be valid in those countries who have adopted the be valid in those countri CEPT licensing system.

50 MHz Operations

50 MHz Operations
CEPT has discussed opening 50 MHz to amateurs. The UK is the only CEPT country permitting amateurs to use part of the 50 MHz band (with restrictions). France, Switzerland, Norway and Sweden are sympathetic to the amateur use of this band but will not allow it for the present. It is therefore expected that a solution will not be found before the year 2000. VERON asked if specific experiments could be conducted when the sunspot cycle was going up again. The Chairman said that the answer will not necessarily be "no

Unmanned Stations The new proposed licensing requirements will

insist that unmanned stations will need a special Up until now repeaters needed separate and special licenses. The new proposals will allow

such a station to be part of an individual station licence (private or club) and no separate request has to be made.

It will be necessary to identify such stations with a special prefix. The suffix can be issued, if possible, as the applicant prefers. Such licenses will initially be valid for one year.

Continuation of experiments is possible but will require a new application.

Before an application is considered Before an application is considered, consultation will take place between the PTT and

the two amateur organisations.
Following are tentative suggested prefixes Two metre repeaters . 70 cm repeaters Linear ATV repeaters ... Beacons
Mailbox stations

Subsequent discussion results in PTT agreeing that all applications will be handled by the two organisations, a situation already in existence

organisations, a situation already in existence with regard to present repeaters.

PTT will not determine, in principle, power, etc of proposed stations. The two organisations decided to co-operate, within IARU 1

recommendations, to determine power antenna heights and antenna gain. Regarding indentification, it will be allowed that an unmanned station will transmit no more than four times an hour the call sign followed by a possible traffic list (mailbox). It is not clear if this is

positive translated by the correct approach.

—Reprinted from ELECTRON, June 1986 and translated by John Aarsse VK4QA

56 CAMPRELL STREET BIRCHIP, VIC. 3483. PHONE: (054) 92 2224. AMATEUR RADIO, October 1986 - Page 43

Contests -



CONTEST CALENDAR

OCTOBER VK/ZL Oceania Phone Contest (Rules August issue) IRSA World Championship VK/ZL Oceania CW Contest (Rules -11-12

August issue) RSGB 21/28 MHz SSB Contest YLRL Anniversary CW Party RSGB 21 MHz CW Contest 1986 Fall CW Contest (Rules August

CARTG RTTY Contest CO WW DX Phone Conte YLRL Anniversary SSB Party

NOVEMBER

15-17

18-19

29.30

-18

Australian Ladies Amateur Radio Association Contest (Rules September

European RTTY Contest (Rules August 8- 9 issue) AHARS National CW Sprint (Rules this -15

15-16 Oceania ORP CW Contest AHARS National Phone Sprint (Rules this -22

CO WW DX CW Contest DECEMBER Ross Hull Memorial VHF Contest begins -13

JANUARY Ross Hull Memorial VHF Contest

- 5 concludes

VK NOVICE CONTEST 1986 Well, I wonder if there is any truth in the rumour ween, I wonder it there is any truin in the fumour that an inche is being built in the wall of a shack in the south-east of South Australia into which the Novice Contest Trophy can be cemented. It certainly appears that Don VKSNOD, intends to try something along those lines as he has emerged as the top scorer in the VK Novice

Contest for the third consecutive year. I guess that by his actions, Don is really throwing out a strong challenge to all to try and wrest the troopsy from him. Our heartlest congratulations go to Don for his fine effort. To win the contest this year, Don increased his composite Phone/CW score by 304 points. This may have been helped by the fact that there were 87 entries in this contest an increase of 28 over last year's effort. This is rather pleasing.

There could be various reasons for the in-creased interest, however I feel that one major factor is the change of time of the contest to the month of June. Most comments point to the fact that it was a very enjoyable event.

Again there has been a fair amount of criticism at the lack of Novice stations operating using the CW-mode. The number of logs submitted for this section increased from four last year to 11 this year, which is certainly a marked improvement. I would like to see this rate of improvement main tained as I know that if more operators try the GW mode in a contest they will find it rather enjoyable and not really difficult. Contest operation is and not really difficult. Contest operation is nothing like rag-chewing, particularly where CW is concerned. So, I suggest that you try it for yourself and find out just what I really mean. You may also care to review the comments included with the results of the 1985 VK Novice Contest dealing with this same subject. I have received little feedback from them

Mention must be made of the fine effort put in by VK4VAT in running a close second in the overall points and a special mention is warranted for VK2PYM, who came second in the CW section in his first contest ever, certainly something to be proud of. Perhaps we might see the VK2PYM call sign way up in the CW sections of other contests in the future. In general, logs were of a good standard,

logs for them. It was also not apparent to some that a separate log was necessary where both phone and CW entries were made.

On the subject of logs, I would like to draw attention to the efforts of Len VK3NLS. I know that Len will not mind me telling this story now, well after the event. Several years ago, I entered into some correspondence with Len due to the fact that his log for a particular contest was definitely not acceptable. Well, I can certainly tell you that in this contest, as well as others, he has submitted a log which cannot be faulted in any way. As well, he has provided additional help by including comhas provided accinional neighbor including com-plete sorting of the log in order of call signs, etc. Yes, Len's log was computer generated but, as I said before, it was immaculate. I suggest that if

you want to find out how to make an excellent log, VK3NLS is the person to approach for advice. Individual scores for the 1986 VK Novice Contest are as follows:

PHONE/NOVICE VK5NOD VK4VAT

| VK7NCP | 778 | VK2JAM | 299 |
|------------------|------------|------------------|-----------|
| VK2NAN | 768 | VK2PYM | 227 |
| VK3NLS | 730 | VK6NTJ | 221 |
| VK7NAI | 596 | VK3PJP | 204 |
| VK2NXA VK3KRI | 594 557 | VK6NSH | 194 |
| | | VK3NBN VK7NBF | 133 |
| VK3VAS VK5NTT | 504 502 | VK3VOJ | 107 83 |
| | 302 | 4K34O3 | 63 |
| CW/NOVICE | | | |
| VK4VAT VK2PYM | 135 | VK8NBC VK3VAS | 37 12 |
| VK2JAM | 110 | VKSVAS | 10 |
| VKINLS | 76 | VK3KRL | 10 |
| VK5NOD | 72 | VK6NTJ | 14 |
| VK7NBF | 59 | TROITIO | - |
| PHONE/FUL | CALL | | |
| VK3EW | 1498 | VK3CLS | 209 |
| VK5SJ | 1343 | VK6QS | 170 |
| VK2CXX | 700 | VK2DOP | 168 |
| VK5QX | 620 | VK3ZI | 146 |
| VK5ATU | 591 | VK6AFW | 122 |
| VK3DOM | 582 | VK3CGG | 113 |
| VK3YH | 530 | VK3XF | 109 |
| VK2AKP | 504 | VK5AGX | 69 |
| VK4OD | 419 | VK3DBQ | 65 |
| VK3BJN | 395 | VK6ED | 64 |
| VK2BQS VK1LF | 311 297 | VK1RH VK3KS | 57 20 |
| VK1LF VK2RJ | 247 | VK3KS | 15 |
| VK2SA | 213 | VK5GZ/8 | 39 |
| | | TROGETO | 39 |
| CW/FULL CA | LL 249 | VK6AFW | 64 |
| VK3NK | 155 | VK4TT | 49 |
| VK2PS | 139 | VK3XB | 46 |
| VK4OD | 113 | VKSOX | 34 |
| VK2DOP | 94 | VK3XF | 27 |
| VK4AOR | 90 | VK3KS | 22 |
| VK5AGX | 88 | VK2CXX | 21 |
| VK3CMZ | 80 | VK6QS | 18 |
| VK2AZR | 78 | VK5ATU | 2 |
| VK2RJ | 72 | VK5GZ/8 | 2 |
| VK4BRZ | 70 | | |
| PHONE/CLU | | | |
| VK3IE | 949 | VK3SCD | 314 |
| VK2IYP | 377 | VK4BPA | 284 |
| SWL | | | |
| L20282 | 751 | L30371 | 87 |
| CW/CLUB | | | |
| CHICLUD | 0.00 | | |

Incidentally, an interesting aspect regarding this contest has surfaced. A telephone call from Don VK5NOD, provided the information that the VK Novice Contest Trophy, which is in the form of a plaque, has the call signs of each winner engraved on it against the year in which the trophy

VK2LE/P

140

VK3IE

VK4RA

CHECK LOGS

was won by that operator. Don pointed out that in each case the "year" shown on the trophy is incorrect. I have asked him to forward the trophy to me so that I can look into this matter. It does seem as if it may be necessary to have the trophy re-worked with the engraved section replaced with the correct information

I would like to express my thanks to all the contestants who entered this years contest and thus helped to make it a much greater success than in the past. I would also suggest that, as it is our annual "Novice" contest, it should be pro-vided with much more support by our Novice operators in the future.

Some of the comments provided with logs

Some of the comments provided with logs submitted this year are as follows: One of the comment "Most activity" I've heard on any 'KV comets except RD. Activity of the comment of the comment of the comment "Do not agree with VK7NBP's remarks are overcrowding in "Do not agree with VK7NBP's remarks are overcrowding in the novice CW segment. The novice CW 3.255.3535 at feast 10 more novices than I ever hear at any one time."—"VKXBB

segment is a WVEV overcomeded. There is always now in the comment of the comment

good point there ureg. The phonetic alphabet accepted for use these days has been specially planned to obviate errors in understanding —FCM)

"I found the contest, at times! was able to operate in it, most enjoyable and very friendly."—YKACE/YK4BA.
"I enjoyed operating in this years comp, everyone seemed to enjoy themselves. Thank you for your time and trouble, lan."—YK3YI.

I despited generating in this water come, everywoo assessing to the control of th

all the VK1e. agree the KU contest they mean nave "I was armused by some of the excuses I was given by phone operators for CW contacts. For example — no ker, when you go have not been contacted to the wind better each excuse which I would have accepted, or maybe the post excuse which I would have accepted, or maybe the post excuse which I would have accepted, or maybe the post excuse which I would have accepted, or maybe the post excuse which I would have accepted, or maybe the case of the contact of the contact of the "... rather a restricted one in regard to time restricted to shift work requirements, June a tot of ORNOOM.

however, some operators left it to me to score their Page 44 - AMATEUR RADIO, October 1986

repecially on 80 — lots of broadcast stations blocking out

sepectary on the months and the second year.

"William Country has been been a second year.

"William Country has been been a second year.

"William Country has been a second year.

"William Country has been a second year.

"Which has been a second year.

publicity for them

NATIONAL CW AND PHONE SPRINTS This month we announce a new and innovati approach to the subject of on-air competition. This is the implementation of two very short "sprints" or "scrambles", one for phone and one for CW to be held in Noven

As Federal Contest Manager I have express strongly my opinion in the past regarding the fact that there are too many contests run on our bands. Further, there has been a large body of opinion to the effect that contests should be fairly tightly restricted as far as frequencies are concerned. In this instance, the approach adopted by the Adelaide Hills Amateur Radio Society Incorporated has quite a deal to commend it. I present the rules for these events at the same time pointing out to you quite clearly that these competitions are not organised by me as Federal Contest Manager, I am simply providing some

The Sprints are a suggested annual event, however if sufficient interest is shown, consideration could be given to running these short competitions on a more frequent basis. You could let me know what you think of this idea which is certainly a new approach to competition on a national basis in amateur radio in Australia I have often entered Scrambles at various conventions and have always found them to be good fun. It seems to me that the rules adopted ensure that there is a frequency restriction applied, (one band only), as well as a time restriction

(One-and-a-half-hours duration). As such, there is a very good possibility that the idea will appeal to many of you who would not otherwise enter into contests at any time. Full details are provided REMEMBRANCE DAY CONTEST

This material is being compiled just one week before the Remembrance Day Contest. I am looking forward to entering same and hope that I will be able to exchange serial numbers with many of you. It will be rather interesting to see just how long it is going to take for the Weighting Factors to change due to Divisional Activity to a degree where they will produce a change in the re-Maybe even this year we will see one of the Divisions make some kind of an effort to improve their score and bring about yet another chang Personally, I am not completely happy with the current approach as I mentioned in my report to the 1986 Federal Convention. I believe now that only a lengthy time period will indicate the true effects of the current system. No doubt, you will have read the comprehensive article written by Ron VK1RH, on the subject of Remembrance Day Contest Scoring and perhaps studied the graphs of activity over the years. I would like to express my personal thanks to Ron for his efforts and also undertaking the calculations needed to determine the weighting factors to be applied to the Divisional scores. I hope that we will all have had a most enjoyable time operating in this years Remembrance Day Contest. By the time you read this I will no doubt be inundated with all the logs that have come in.

ROSS HULL CONTEST Next month, I will be providing details of the rules for the Ross Hull Memorial VHF Contest. Again. quite a few changes have been made in an attempt to even out the competition and provide a more universal appeal. Depending on the results, a decision will most definitely be due as to just what will need to be done about this contest. Up until now I have not received much in the way of feedback from the Discussion Paper, which was circulated to each of the Divisions in May. So far, only two Divisions have provided anything in the way of comment. Now, I wonder whether there is really any interest at all in this contest. Sometimes, I am inclined to think that I am perhaps just being ignored. It is a lonely feeling at times although I can console myself with the thought that if I don't hear from anyone it is not really due to apathy but rather that I must be getting things right and thus I am left alone. I wonder what the true story really is???

VK/ZL CONTEST

I expect that you have noted the different in the rules provided by Jock White ZL2GX, this year. In discussion with Jock on one of our regular scheds, he informs me that the basic idea is to make the contest more attractive for those who cannot spare the full 24 hours for operation and also to encourage more activity. There will certainly be some strategic advantage in knowing just when which band is likely to be open. Yet again, we may see some changes from the usual pattern of the same stations coming up with the top scores year after year. Or will we

GENERAL CONTEST INFORMATION From time-to-time I am asked by individual operators for basic information as to how one goes about entering into contests. I also receive suggestions along the lines of running a separate section in the notes for beginners.

There is some merit in such things, however, it is also necessary to explain a little with regard to the production of these notes and the limitations brought about by the nature of our magazine. Some of the problem comes about due to the lack of time available to me to sit down and write up separate material for this column. I have to try and keep up to date in the matter of contests and information which needs to be disseminated as currently as possible. Next is the fact that not a lot is to be gained in going over old ground. There will always be newcomers to the scene, and I am as keen as anyone else to encourage them in their activities. Most operators who are interested in trying out in the contest arena will be able to find some friendly operator to either explain in person or over the air, just how to go about starting in this type of activity. Then again, it is possible that they can gain more information by looking back over old issues of Amateur Radio

When I became Federal Contest Manager a few years ago, I did go to the trouble of producing a series of articles as part of these notes. The articles covered a wide range of topics such as: setting up your station; operating in field day contests; preparing logs and check sheets (including examples); planning your operating and tactics as well as providing general hints designed to help in making your contest operations more enjoyable.
Maybe you could review these articles if you are

unsure as to what you need to do in e contests. (It also occurs to me that I could polis them up just a little and ask the editor if he would be prepared to reprint them as a series on contesting. To do this however, I will need to find some time over and above what I have available at the moment). Still, I do hope that I am making a useful

contribution to the hobby and I still welcome any suggestions which you may have to help improve this column and its presentation. Meantime, while I try and do something about these matters, you may try and find those back issues. Look for them from about the August 1984 issue, onwards. Meantime, I again wish you all the best in your activities and trust that you will enjoy the various events coming up in the future.

-73 de lan VK5QX

NATIONAL CW AND PHONE SPRINTS The Adelaide Hills Amateur Radio Society Inc, is delighted to announce the inaugural National Sprints, a pair of "quickie" contests for CW and phone operators, to be held during November 1986. The National Sprints will be similar in nature to local scrambles, but nation-wide participation makes them something new in Australian contesting. The National Sprints are endorsed and supported by the South Australian Division of the

Vireless Institute of Australia, which will provide certificates and trophies The reasoning behind the National Sprints is this — there are too many "big" contests each year; they require a lot of time and the rules are year; tney require a lot of time and the rules are complex, thus discouraging many operators from participating. The National Sprints are short, sharp and simple, requiring a minimum of time while providing a significant operating challenge. Object of the Sprints

The operator's basic goal in the Sprints is to make as many contacts as possible (without duplication) during an hour and a half of operation on a single Any contact on 80 metres during the st Period including DX, can be counted, but lon may only be deliver. hand

Contest Period including DX, can be counted a station may only be claimed once Eligibility
The National Sprints are open to any licens amateur or group of amateurs using a single call sign; eg club stations, anywhere in Australia (VK

call areas).

Contest Period
1200-1330 UTC November 15, 1986 (CW Only)
1200-1330 UTC November 22, 1986 (Any le phone mode)

Frequencies
For the CW Sprint, frequencies between 3,500 and 3.700 MHz may be used.
For the Phone Sprint, frequencies between 3.535 and 3.700 MHz may be used.

Irrespective of any provision contained in these rules, operators are reminded that they must operate in accordance with the terms and conditions of their respective licenses and

applicable regulations. CONTEST CALLS CQ Sprint or CQ Test or CQ Contest. EVCHANGES

Minimum exchange for a valid contact will cons of signal report and a three digit serial number. The serial number may start at any number between 001 and 999, but will revert to 001 if 999 has been reached

Logs
Contest logs must show for each contact the time
(UTC), call sign of station worked, report/serial number given and report/serial number received. Each log must be accompanied by a cover sheet showing the date and name of the Sprint (CW or Phone), the total number of contacts claimed, and a statement that the operator has abided by the rules of the contest, signed by the operator/s. Any special conditions such as QRP or mobile operation should be mentioned in the statement. Logs are to be in the hands of the Society no

later than Friday, December 5, 1986 and can be addressed to: National Sprint Manager, c/- AHARS, PO Box 401, Blackwood, SA. 5051.

Certificates will be awarded to the highest scorer in each Australian call area for both the CW and

the Phone Sprints. Trophies will be awarded to the outright winner of each Sprint Certificates may be awarded to other operators whose performance was, in the opinion of the

organisers, exemplary.
Any entry which is patently in violation of the rules or spirit of the Sprints, or which contains an excessive number of claimed duplicate contacts

(this does not refer to duplicates which have been indicated as such and are not claimed), may be disqualified. The decision of the Society' in respect of the

interpretation of these rules, granting of awards, or disqualification will be final.

COMMONWEALTH CONTEST 1986 According to some of the pundits, Cycle 21 has finished and we are again on the way up. The number of VK entrants in this contest seems to be

very much tied in with conditions, the members in the last three years 84-66; 85-58 and bottoming

this year at 52, (but still a very respectable total), the turn-up must have taken place sometime after the second weekend in March! Few VKs would have labelled the conditions during the contest as

However, though the outright winner scored only 250 odd points more than the year before, Russ Coleston VK4XA, improved his position from Russ Coleston VK4XA, improved his position from eight to fifth, and scored 830 points more than in 1985. As will be seen from the table below, only 150 points separated the top three, 6Y5HN, making the highest number of QSOs, 47; VE3BVD 416; VE6OU/3 400; while Russ made 276. In the race for bonuses, VE7CC was top at 155, G3FXB 141, and Russ 133.

Though not so many ZLs seemed to be operating as in 1985, there were at least a few - it vas disappointing that only three of them appear In the Receiving Section, Eric Trebilcock made

| it four in a row v adversary, BRS | rinning by 1066. | 105 points ove | r his old |
|--------------------------------------|---------------------|----------------|-----------|
| 1. VE3BVD | 4550 | 6. G3FXB | 3945 |
| 2. 6Y5HN | 4414 | 7. G3PEK | 3555 |
| 3. VE7CC | 4400 | 8. VK2BQQ | 3517 |
| 4. VE6OU/3 | 4139 | 9. G3MXJ | 3468 |
| 5. VK4XA | 3991 | 10. ZL1AIZ | 3462 |

RECEIVING SECTION

| S. VK4XA | 3991 | 60. VK2EL | 1342 |
|------------------------|------|-------------|------|
| 8. VK2BQQ | 3517 | 64. VK3KS | 1275 |
| 11, VK2AYD | 3460 | 66. VK4BSQ | 1265 |
| 13. VK3MR | 3302 | 67. VKBHA | 1250 |
| 14. VK6LW | 3295 | 69. VK7RY | 1204 |
| 21. VK7BC | 2895 | 71. VK2SU | 1162 |
| 23. VK3AUQ | 2680 | 74. VK4TT | 1115 |
| 26. VK4APZ | 2585 | 79. VK6AJ | 1040 |
| 27. VK3DQ | 2517 | 80. VK3DOV | 1036 |
| 28. VK6IT | 2509 | 82. VK5BS | 987 |
| 29. VK2ZC | 2501 | 89. VK3XB | 792 |
| 30. VK5AGX | 2474 | 90. VK3RJ | 785 |
| 31. VK2AQF | 2412 | 91. VK6ED | 770 |
| 32. VK5BN | 2351 | 92. VK2AZR | 758 |
| 33. VK5UM | 2350 | 93. VK5RG | 749 |
| 33. VK6HQ | 2350 | 94. VK4BKM | 745 |
| 36. VK4XW | 2302 | 95. VK3XF | 732 |
| 40. VK2BAT | 2025 | 96. VK6AUX | 724 |
| 44. VK3BDH | 1892 | 98. VK4SF | 665 |
| 45. VK2DID | 1860 | 99. VK7ZO | 640 |
| 47. VK5GZ | 1735 | 102. VK3FC | 582. |
| 49. VK2APK | | 104. VK6RZ | 560 |
| 50. VK3MJ | 1687 | 106. VK2GT | 550 |
| 51. VK3ZC 55. VK7CH | 1685 | 121. VK4RAN | 235 |
| 55. VK7CH | | 121. VK4NUN | 235 |
| 57. VK6RU | 1464 | 124. VK2HC | 202 |

35 MHz VK3XB Overseas Leader, VK4NUN 7 MHz VK2APK Overseas Leader, VK3FC, VK6RZ 14 MHz VK3KS Overseas Leader, VK3RJ, VK4BKM, VK4RAN, VK4TT, VK6AJ, VK8HA

Congratulations to Ivor and Mavis Stafford who took out two of the single-band awards using their joint station — apparently Ivor on the air while Mavis was in the kitchen!

| PACIFIC AREA | SCORES | | |
|--------------|--------|-----------|------|
| 10. ZL1AIZ | 3462 | 38. ZL1HV | 2134 |
| 15. P29PR | 3287 | 48, ZL2TX | 1730 |
| 17. T30AT | | 81. P29FJ | 990 |
| 22. 9V1TL | 2775 | | |
| | | | |

VK TEAM EVENT AND AWARDS New South Wales comfortably retained the four man team title, defeating VK3 by 1500 points, with VK4 team third Comparative totals for the past five years are as below. The UK, had they been in the competition, would have won, hands down, four years out of five.

| - | VK2 | 11890 | 10632 | 16272 | 10467 | 13450 | _ |
|---|------|-------|-------|-------|-------|-------|---|
| | VK3 | 10391 | 8784 | 14549 | 13062 | 15813 | |
| | VK4 | 10143 | 8359 | 12475 | | | |
| | VK6 | 9618 | 6482 | 10303 | 6776 | 9748 | |
| | VK5 | 8910 | 8751 | 8965 | 6822 | 7760 | |
| | VK7 | 6274 | 7982 | 7571 | 5199 | 9865 | |
| | G | 14408 | 13193 | 17064 | 10872 | 20384 | |
| u | VARD | s | | | | | |

The Gold Medallion for the leading VK entrant was won by Russ Coleston VK4XA.

The Silver Medallions for the leading State Team

were won by K Nad VK2BQQ, D Pilley VK2AYD, Jim Cowan VK2ZC and E Carruthers VK2AQF HOW THE LEADERS MADE THEIR SCORES QSOs/Bonuses per band 80-10 (claimed).

| VE3BVD | 59/23 | | 223/35 | | |
|---------|-------|--------|--------|-------|-----|
| SYSHN | 37/15 | | 223/35 | | 1/1 |
| VE7CC | 37/29 | 86/45 | 102/52 | 44/29 | |
| VE6OU/3 | 23/17 | 119/43 | 237/32 | 21/21 | |
| VK4XA | 34/19 | 67/36 | 120/40 | 46/29 | 9/9 |
| | | | | | |

The adjudicator, Alan Gray G4DJX, has produce through his computer, a very interesting series of tables covering the results in each of the main geographical areas of the Commonwealth. Of geographical areas of the commission of those who submitted logs, so the overall totals would in fact be creater — 13405 QSOs were made in the 24 hours, 7103 bonus areas worked, 31 unmarked duplicates were noted (22 of them on 14 MHz) and a total of 204 020 points were credited. Our 52 entrants were the most from any one country, but the Gs are creeping up, to 46.

The table below shows the number of suffixes per call area per band, worked by stations outside the UK. By next year we will have a similar table showing the same information as worked from VK. In the rare area class were ZL4 (I) worked by one VK, and VE2, VK1 and ZB2 worked by two

CALL AREAS WORKED FROM OVERSEAS

| BANDS | | | | | | | |
|---|------------------------|-------------------------------|--------------|-----------------|-----|---------------------------------|--|
| AREA | 3.5 | 7 | 14 | 21 | 28 | TOTA | |
| A2 A3 G P2 T30 VE1 | | 1 | | | | | |
| A3 | 67 | 175 | 340 | 150 | 3 | | |
| G | 67 | 175 | 340 | 150 | 1 | /3 | |
| P2 | - 1 | í | 1 | 2 | - 1 | | |
| 130 | 8 3 13 | 19 | 14 | 6 2 16 | | 4 | |
| VE2 | 3 | 13 36 36 3 5 2 | 7 | 2 | | 1 | |
| VES | 13 | 36 | 39 | 16 | | 10 | |
| VE2 VE3 VE4 | | 3 | 5 5 13 | | | 10 | |
| VES VES | 4 | 5 | 5 | 2 | | 14 | |
| VF6 | 1 | 2 | 5 | | | - 1 | |
| VE7 | 2 | 9 | 13 | 7 | | 3 | |
| VE8 | | 1 | 1 | | | | |
| VK1 | 1 | 1 | | | | - 3 | |
| VK2 VK3 VK4 VK5 | 9 15 8 6 6 | 18 | 22 | 16 | 4 | - 6 | |
| VK3 | 15 | 23 | 23 | 11 | 4 | | |
| VK4 | 8 | 11 | 11 | 5 | 2 | 3 | |
| VK5 | 6 | 11 | 12 | 10 | 2 | 3 | |
| VK6 VK7 | 9 | 12 | 12 | 5 | 1 | - 3 | |
| VK/ | ۰ | , | 6 2 | | | | |
| VK8 VK9N VO1 VP2M VQ9 VS6 VU Z2 ZB2 | | 1 | - | | | 3 6 7 3 3 4 2 | |
| VIOI | 4 | 5 | 3 | 2 | | 1 | |
| VP2M | | 1 | 1 | - 1 | | | |
| VOS | 1 | 1 | 1 | 2 2 1 1 1 1 1 1 | | | |
| VS6 | | | 3 | 2 | 1 | | |
| VU | | 6 | 9 | 1 | | 1 | |
| Z2 | | 2 | 1 | , | | | |
| ZB2 | . 1 | 6 2 1 3 | 1 | -1 | | | |
| ZC4 | | 3 | 3 | 1 | - 1 | | |
| ZD8 | | 1 | 1 | | | | |
| ZLO | - | 14 | 10 | 8 | | | |
| ZL1 | 9 | 14 | 10 | 4 | 3 | - 7 | |
| ZC4 ZD8 ZL0 ZL1 ZL2 ZL3 ZL3 ZL4 | 3 | 6 | î | ï | | | |
| 71.6 | | 3 | i | | 1 | | |
| 202 | | 1 | i | 1 | | | |
| 3D2 3D6 | 1 | i | - 1 | i | | | |
| SH | | 1 | 2 | 1 2 | 1 | | |
| 5H 5N 6Y | | 1 | 2 2 2 | 2 | 1 | | |
| 6Y | 1 | 2 | 2 | 1 | 1 | | |
| 8P 8R | | 1 1 1 1 | | | | 4 2 2 | |
| 8R | | 1 | | | | | |
| 9H | | 1 | 1 | | | | |
| 9.1 | 1 | 1 | 2 | 1 2 | 1 | | |
| 9V | 1 | , | 1 | 2 | 1 | | |
| AREAs | 28 173 | 43 | 41 579 | 34 | 19 | | |
| SFXs | 172 | 389 | 670 | 274 | 30 | | |

A total of 46 Call areas were worked.

RSGR COMMENTS

If you are looking for a contest to enjoy, work DX and make many friends, then this is the one. It could also be a very profitable one if you are to believe the rules as published in the Australian magazine Amateur Radio which stated that "each completed contact will score five pints." !!! As Kev Phillips VK3AUQ put it — "the rules say! can claim five pints per contact, so I should claim for 745 pints or 93 gallons and one pint." Well Key, I've heard that Aussies are big drinkers but could you really cope with that amount of alcohol???? There were 126 entrants who made a total of

13405 QSOs including 67 on 28 MHz - an

improvement on last year Although conditions were slightly better many stations still struggled to make contacts: the thrill and excitement seems to make contacts; the thrill and excitement seems to lie in the challenge to dig out those call areas from the noise and QRM. Perhaps it is the gentlemanly (apologies to the YL operators) operating with many stations using the contest to keep in touch with old friends, which makes it so much fun. Even though there are many OTs — some in their 80s — who regularly participate, it is by no means an old mans' contest with many youngsters on the scene making a challenge for the honours: eo. VK6LW, G4BUO.

K6LW, G4BUU.
This years winner is David Dudley VE3BVD,
to made an impressive 4550 points from 416 who made an impressive 4550 points from 416 QSOs and receives the Senior Rose Bowl. David used a TS830S, plus an MLA 2500 feeding 80 metre phased verticals, 40 metres three element, two element Yagi, 20 metres six element, four element Yagi and 15 metres five element.

and a four element beam at 33 feet (10 m). Last years winner, Lee Sawkins VE7CC, came a very close third at 4400 points from 268 QSOs using a TS820S plus LB4 feeding an 80 metre sloper array, 40 metre two element Yaqi at 100 feet (30 m), 20 metre five element Yagi at 105 feet (31 m), and 15 metres four element Yagi at 90 feet (27 m). All Slater G3FXB, returns as the number-one UK entrant winning the Col Thomas Rose Bowl with 3945 points from 235 QSQs and used a T4XC/ R4C combination with 80 metre slopers, three element and two element Yagis and quad loop on 40 metres and a 20/15 metre guad.

Eric Trebilcock wins the Receiving Rose Bowl in his 46th Entry. Mention should also be made of the efforts of Russ Coleston VK4XA, who leads the Australian entry for the seventh year in succession

Congratulations to all the trophy winners, and to all who received certificates.

The Australians had an impressive turn out, the only disappointment being the lack of VK1 activity VK8HA, despite his other commitments, managed

to provide many with a sought after call area.
T30AT was a welcome sight to most but was not heard here in the UK, but the UK does hold the advantage when it comes to working Africa. In all some 53 call areas were worked — again

n increase on last year. There were reasonable 20 metre openings from the UK to Oceania at the start of the contest with Canada and Africa appearing later. The 15 metre band was in good condition to Africa on both days but was very poor to other areas. For a very limited period 10 metres

Only two entrants from the UK made a contact with 9J2BO who was 559 at 1444 UTC. There was little HF activity during the night. The 40 metre band was fair, being open to all of Oceania, with Al Slater contacting 28 call areas — obviously those beams work! But 80 metres was disappointing and only Barry G3PEK made any real impression with his vertical and extensive radial system. ZL3GQ was particularly loud on any band! Once again it is was particularly loud on any barrier of the again it is those stations who have a good knowledge of band conditions who can make the most out of this contest. Unfortunately for the VK contingent. storms off two coasts produced high noise levels which made reception difficult especially on the LF bands which could be why modest set ups failed to produce results this year.

With the Golden Anniversary next year, the RSGB are making some special arrangements to celebrate one of the oldest radio contests in the world. Full rules, with details of the arrangements

will be published later Make a date in your diary now for the second full weekend in March next year — something not to

be missed! ! Many thanks to the following stations who sent

G3CXM, G3GMM/A, GW3JI, G3OZF, G3WP, G6NK and VK3KF. Special thanks to John Tutton VK3ZC, for his invaluable help in promoting the event "down under."—G4DJX.

-Contributed by John Tutton VK3ZC

FIRST IRSA WORLD RADIO CHAMPIONSHIP

Phone: Saturday, October 4, 1986, 0000 to 2400

CW: Sunday, October 5, 1986, 0000 to 2400 UTC. Single operator stations may operate no more than 22 hours out of the 24 hours on each mode. A minimum of two hours rest time may be taken in

one or two rest periods. All multi-operator stations can operate for the full 24 hours. Objectives: For amateurs around the world to contact other amateurs in as many countries as possible. All contacts with fixed or mobile licensed amateur radio stations around the world, including

own country, count. Number Exchange: Signal report plus the consecutive QSO number starting with On1

(59001 phone and 599001 CW). Points: Each correctly sent exchange is worth one point, each correctly received exchar one point, each correctly received exchange is worth one point on phone and two points on CW: a total of two (three on CW) points for each error free contact. The same station can be contacted only once on each band and mode for a valid point credit. Contacts with own country count also. liers: On each band a multiplier of one for each different DXCC country contacted, plus one for each call area in the following countries: Australia VK1-8: Brazil PY1-8: Canada VE1-8. VO1 VO2, VY1; Japan JA1-0; European RSFSR — USSR UA1, 3, 4, 6; Asian RSFSR — USSR UA9, 0; USA W/K/N etc 0-9. (Do not count VK1 as a VK - country too). Also, a multiplier of one each for the land, maritime and aeronautical mobile group /M, /MM. (AM. Stations, except mobiles, operating from another call area must sign their call with a slash and a number of the area; eg K4VX/0,

Scoring: The final score is the result of the total

QSO points from all bands multiplied by the total multipliers from all bands. Categories:
H. High Power — stations using the maximum

.....gri rower — stations using the maximum legal limit up to 1000 watts output, (2000 watts PEP).

Low Power — stations using the maximum output power of 100 watts (200 watts PEP Q. QRP - stations using the maximum output

In each of the above power groups there are the following categories:

A. Single Operator — All Band B. Single Operator — Single Bands: 160, 80, 40, 20, 15, 10 metres.

C. Multi Operator — Single Transmitter.
D. Multi Operator — Multi Transmitter.
E. Club Competition — Combined.

of five watts (10 watts PEP

Combined Phone and CW scores will be used the main competition category. Phone and CW results will also be listed and awards issued Category A and B can be operated by a single operator, without any other assistance from other operators, repeater nets or bulletin boards.
Category C and D includes club stations,

stations operated by more than one operator and single operator stations using repeater, spotting nets or any other assistance when operating Single transmitter category stations may use only one transmitter which is connected to the power source during the contest. In case of failure, it may be replaced by another transmitter. Spotting operators may use receivers

transceivers with transmitter disabled only. The multi transmitter category stations may erate one transmitter per band simultaneous All transmitters must be located within a 500 metre diameter or within the property limits of the station licensees address. The antennas must be physically connected by wires to the transmitter.

Category E — Club competition entries may claim a maximum of one station per category, in a selected power group, on each mode (maximum - nine on phone and nine on CW). The final club score is the addition of individual highest scores made by the club members on both mode Expeditioners and mobile operations by the club members can also be counted. The club ficial must submit a list of stations, their catego and

scores. Each power group will be judged senarately Awards: there will be awards of certificates.

trophies and plaques Log Instructions: All dates/times must be in UTC. All the sent and received exchanges must be logged. A multiplier should be indicated only the first time it is worked on each band. Logs must be checked for duplicate contacts, correct QSQ points and multipliers. Do not use separate sheets for each band, except for multi operator, multi transmitter stations who should keep separate logs and numbering per band. Single operator stations must clearly mark the rest periods in the log and should indicate the total operating time on the summary sheet. A sample contest form kit is available from IRSA for a SAE and US\$1 or 3 IRCs.

All participants are encouraged to send the log in regardless of their score. They are needed for checking purposes.

A one year subscription to Radiosporting magazine will be awarded to the 10 stations selected by a draw from the logs received. Deadline: Logs must be mailed not later than 30 s after the contest and be in the hands of the IRSA WRC Contest Committee by December 31, 1986. Logs to: IRSA WRC Contest Chairman, W3FG, PO Box 7, Odenton, MD, 21113-0007, USA.



W0AIH/9, etc.

Intruder Watch

Bill Martin VK2COP FEDERAL INTRUDER WATCH CO-ORDINATOR 33 Somerville Road, Hornsby Heights, NSW. 2077

Ulrich DJ9KR, the DARC National Bandwacht (Intruder Watch) Co-ordinator, reports that the net of the "Ministry of Foreign Affairs," in Islamabad, has, as a result of complaints, QSYed from around 14.345 MHz to 14.385 MHz. They should no longe be a problem to amateurs active on the top end of 20 metres. I have no evidence of interference in VK from the net, but it is nice to know that intruder watchers around the world are keeping an eye on things

INTERFERENCE BECOMING RIFE Moving a little south-east, a letter from Bernd DL7MV, of Bandung, Indonesia, gives us the

Bernd is the ITU senior training expert, RF Monitoring Branch, in his area, and tells me that he is interested in trying to help the Intruder Watch with the problem of the alleged Indonesian interference which is becoming rife on 28 MHz. I hope to be able to tell you more on this later.

HELPERS FOR THE MONTH

More good help in June 1986, from VK2s DVW, PS, QL, Mr G H A Bradford, VK3s AMD, CGG, VK4s AKX, BG, BHJ, BN, BTW, DA, KHZ, VK5s BJF GZ, VK6s JQ, OD, RO, XV, VK7RH, VK8s HA and IF

There were 278 cases of broadcastin terference reported, 141 in the CW mode, 6 RTTY pests, 38 other modes and 38 stations d. The VI prefix is authorised for use in South Australia until December 31, so don't suspect piracy if you hear someone using this OH! SO ENVIOUS

Often, as I write this column, I think of and envy those who write DX news columns — while they on one hand, can pass on the good news of wh

are about on the bands for the chasing, I have, unfortunately, only news to pass on of those who shouldn't be on the bands. One of these days I will indulge in a fantasy, and report that intruders were heard for the previous month!!!

USSR SHIPPING

Some interesting information to hand, courtesy of Colin VK2PLV, who saw it in Popular Communications, October 1984. The article was written by Harry Caul KIL9XL, and deals with

signals to and from USSR shipping.
Harry says, "Vessels belonging to the Soviet Merchant Marine, have radio call signs which are generally four-letter types, commencing at the letter U or some other prefix assigned to the USSR, Typical examples would include:

"ESXC (cargo vessel Magnit); UQIR (freighter Labinski; and ERUQ (freighter Gueograf). These call signs are shown in international merchant marine communications registries for commercial purposes. The radio call signs of fleet vessels of the Soviet Navy, of course, would not appear in the registries" and "for CW operations, vessels communicating with the U prefixed shore stations will most likely be using frequencies within the same band as the shore station, first establishing contact on a calling frequency and then switching to a mutually agreed-upon working An extensive list of call signs accompanies the article and the infamous "UMS" appears, being listed as operating from Moscow.

So we learn a little more each day. As I close the column for this month, I point out that by far the greatest number of intrusions into our bands are by stations whose call signs begin with the letter "U"! Hmmm. See you next month, and take care.

WILLIS AIR-WOUND INDUCTANCES **Tinned Copper Wire on** Polystyrene Supports

8 2-08 8 \$2.50 8.00 \$3.05 8 2.90 \$3.38 \$3.38 5-08 B-04/4 18 32.25 83.50 8-06/7 8-10/7 50.80 12 19 157.75 WILLIS Air-Wound Inductances are a high

uality product manufactured to the requirements of professionals in the electronic field.

The coils listed above are classed as 'Bulk Inductance' and are intended to be pruned for individual requirements. Complete coils can be used of course, if the total inductance is the

The inductance values shown are approximate allowing for any variations in wire gauge and other small manufacturing variables.

Take the hard work out of Coll Winding — us "WILLIS" AIR-WOUND INDUCTANCES WILLIAM WILLIS & Co. Ptv. Ltd. 98 Canterbury Road, Canterbury, Vic. 3126 PHONE: (03) 836 0707

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Awards

AWARDS ISSUED RECENTLY DXCC PHONE

347 Bill Garvey VK2CWG

1400 Club Station, Novorossisk UK6AAJ 1490 Victor H Apukhtin UW1CX

1401 Valery Matoushin UA9NN Paul Chipenko UA0LCM 1492 1493 W W Kostiuk UB5MDL 1494

Mikhael Kamendrovsky UA1AWO George Alferyev UB5WJ Alex Zelenin UA3QJK 1495 1496 1497 Alex Ertskin UA0ABK Vladimir A Korolev UA000 1498 1499 O E Novichkov UA9YDX

HAVKCA Igor Tolmachev UA1 169 898 Alex Tkachenko UA3 147 122 116 Alexandr Maslow UJ8 040 207 S E Stepanov UA9 130 272

WIA 75 AWARD

Following is an update to recipients of the WIA 75 Cert No - 666 Eduard Anwar YC3CPJ Cert No — 667 George R McKercher W0MLY
Cert No — 668 Donny Sirait YC&LD
Cert No — 669 Andrew Woolf VK2EPO

Cert No — 670 Soemardiono Isnaeni (Isna) YC3JVW Cert No - 671 Herman Chosim YC3BR Cert No — 672 Bambang Sutiyono YC2BLR

MARION CENTENARY AWARD Further to the Marion Centenary Award which wa announced in last month's column, the extremely attractive Award Certificates have been printed

The International Radiosport Association is an independent international organisation dedicated amateur radio. Its purposes and objectives are: To promote international friendship and goodwill

through sportsmanship, radio contesting and DXing.
To improve the quality of amateur radio operators

and operating through education and experience, by voicing the opinions of radio amateurs that are experienced and have contributed to the hobby. To promote amateur radio contesting and other operating-related activities as a sport, and to provide the publicity and recognition that it

deserves in the public media. To publish timely articles in the monthly magazine Radiosporting, to feature technical articles on equipment design and modification, antenna construction, radio-wave propagation, and commercial equipment reviews by qualified

people.

To organise, as an annual event, the *international*Contest Symposium, which runs parallel (evenings) with the Dayton Hamvention; to feature timely topics with the participation of some of the

world's leading amateurs at the symposium. To hold an annual Awards Dinner with an entertainment program, where awards for various achievements are presented. To maintain and publish all time record tables for

significant contests
To sponsor and run an annual World Radio Championship Contest and World Contest Championship, based on results of a number of major contests, with the annual Contester of the Year awards in various categories.

To administer the Contest Hall of Fame and vote

on awarding membership to those who have on awarding membership to those who have significantly contributed to the sport of contesting. To co-ordinate and assist in the scheduling of international contests To hold regular weekly meetings on air, 14.200 and 3.380 MHz. To provide an automatic, computer controlled

bulletin station that transmits the latest DX and Contest news on CW and RTTY, 14.098 MHz. All in all, the IRSA is dedicated to the pursuit of excellence and quality in amateur radio by promoting, publicising and leading the way. Attractive numbered membership certificates and

Each Award will be despatched in a sturdy mailing tube to ensure safe delivery. See page 44, September AR for full details for claiming the Award. INTERNATIONAL RADIOSPORT ASSOCIATION es are issued to members IRSA is run by contesters who are selected for to the promotion of quality and sportsmanship in 1963 Cay of Marion SAMPLE

Ken Hall VKSAKH FEDERAL AWARDS MANAGER St George's Rectory, Alberton, SA, 5014

their accomplishments and it is independent of any national or commercial organisation. IRSA will assist and sponsor Contest/DXpeditions. Trophies and other radio sporting and publicity

IRSA is a non-profit organisation, with all proceeds to be used to finance events and awards sponsored by IRSA and to cover expenses incurred by the Association IRSA members can display the IRSA logo on their

QSL cards and correspondence; members agree to obey the Contester's Code of Ethics and to The initial fee to join the IRSA id US\$9; it

includes the cost of a certificate and a badge. Th yearly membership dues are US\$4. (Or 22 and 10 IRCs respectively).

Honorary Life Membership will be awarded to

those who significantly contribute to IRSA and the sport of contesting. Members are entitled to be elected and to elect officers of IRSA. They will also enjoy many services and privileges offered exclusively to

IRSA Board of Directors

members

Yuri VE3BMV, George VE3MRN, Terry N6CW, Frank 9Y4VU, Sam ZS6BRZ, Dave Goodwin-Hill, Gyuri HASJI, VEZZP, Jiri OKZRZ, Tack JE1CKA, Bob VE3KZ, Karol VK2BQQ, Larry N7DD, Jim VE3IY, Martin VE3MR and Mike VE3JTQ. DX Century Award GENERAL BULES

he DXCA program is sponsored by the IRSA and Radiosporting magazine for all licensed radio amateurs and shortwave listeners all over the world. All contacts must be made from the same

country. Maritime, aeronautical and land mobile Stations may operate from anywhere in the world.

Only contacts made after January 1, 1986 are valid for the basic award. Awards for club stations will be issued to the

club and not to an individual operator. All amateur bands for which an applicant holds valid license may be used, including new WARC bands.

QSL cards for the awards must be in the possession of the applicant. The application for the award must be certified by two licensed amateurs with a statement that the list of contacts and QSL cards agree. Any altering or forging will result in disqualification. The IRSA Awards Committee has the right to request the QSL cards for verification The ARRL DXCC countries list criteria will be

used in determining what constitutes a "country."
A particular operation or DXpedition does not have to be recognised by the ARRL in order to count for DXCA; ie Burma. As long as there is a reasonable proof that the operation took place as claimed, it will be recognised. If it is found in the future that certain operations were not legitimate, the credit for that operation will be removed from all applications claiming the operation in guestion.

All officially allowed modes of communication may be used: CW, SSB, AM, FM, Packet, RTTY, SSTV and Mixed-mode. Also separate categorie will be recognised for satellite contacts, QRPp and mobile stations. All contacts must be two-way, using the same mode, except for the mixed mode. A valid contact must consist of a call sign and signal report exchange.

All claimed contacts must be made by the operators themselves, without the help of a third party; ie list or net operation. Non-interference with commercial services on shared bands, fair with commercial services on snared bands, fair play and good sportsmanship are required of all DXCA holders and applicants. In the event of specific objections relative to continued poor operating ethics, an individual may be disqualified from the DXCA by action of the DXCA Awards

The application must contain a station's call sign, name and address, type of award applied for and list of contacts. The list of contacts and any QSL cards in possession must include: call sign, signal report received, band, date, time in UTC, and two-way mode.

Call signs of all certificate holders will be published in *Radiosporting* magazine and a DXCA Honour Roll will be published twice a year. The first 20 winners of monoband and multi-

band awards will receive a free one year subscription to Radiosporting magazine.

The decision of the IRSA Awards Committee will be final.

All applications to be sent to IRSA — DXCA, Box 282, Pine Brook, NJ, 07058, USA. SINGLE BAND DXCA

Single band DXCA Century Award is issued for working or hearing a minimum of 100 countries on one band. Endorsement stickers are issued in increments of 20 countries up to 240, increments of 10 up to 300 and increments of 5 above 300

countries.

Contacts made on all amateur bands (1.8, 3.5, 7, 10, 14, 18, 21, 24, 28 MHz and all VHF/UHF bands), as permitted by the license in the country of the applicant, are eligible for the award. All contacts must be made on one band. No crossband contacts are allowed.

The basic award will be issued for a minimum of 100 countries confirmed on one band. A numbered endorsement sticker will be issued for each mode (CM, AM, SSB, FM, RTTY, Packet, SSTV and Mixed) and category (satellite, QRP.

QRPp and mobile stations).

The holders of Single Band DXCA are allowed to use the abbreviation signifying the type of award and country total on their QSL cards.

Examples: 1.8 DXCA or 1.8 CW DXCA 124/265

Examples: 1.8 DXCA of 1.8 CW DXCA 124/2bs which means Monoband: 1.8 MHz all CW mode, DXCA, 124 countries confirmed since January 1, 1986/number of countries worked. MULTI BAND DXCA

6B DXCA, 7B DXCA, etc awards will be issued for confirmations from a minimum of 100 countries on each of at least six bands. A separate award will be issued for working 100 countries on 7, 8, or more hands.

Also, a cumulative total will be kept for an overall countries count similar to the monoband award: ie 78 DXCA (856/1265), which signifies that station has confirmed a minimum of 100 countries on each of seven bands and the total count is 856 countries since January 1, 1966 and 1265 countries on seven bands worked. A numbered sticker will be issued for each mode

and category.
Stations having monoband DXCA need not submit the list of contacts already credited for monoband awards. It is sufficient to mention the

certificate type and number, and only an additional list of contacts has to be submitted. Stickers for increments of 100 countries will be issued from 600 to 2000, increments of 50, from 2000 and up.

The Honour Roll — listing of top contenders and latest changes in standings will be published in Radiosporting magazine twice a year.

The fee for each award is US\$5 or 10 IRCs and each endorsement sticker is IIS\$5 or 4 IRCs.

each endorsement sticker is US\$2 or 4 IRCs. Engraved Honour Roll Plaques will cost US\$25. A set of application forms and countries list for DXCA awards are available from IRSA for an SAE and 3 IRCs.

THE PADDLE STEAMER INDUSTRY JUBILEE 150 AWARD

JUBILEE 150 AWARD

Further to the announcement of this award in last months Awards Column, an illustration of the

award is presented this month. The award is signed by the Mayor of Renmark, Mr Lionel Sims. It is a three coloured award depicting the paddle steamer Industry grouped with grapes and citrus fruit, local produce of the Riverland. There is also a short history of the PS Industry.—Contributed by Doua Tambhin YKSPDT, Awards Manager.

NIGERIAN AMATEUR RADIO SOCIETY 25TH ANNIVERSARY CELEBRATION SPECIAL AWARD 1961-1986

During 1986, the Nigerian Amateur Radio Society celebrates its Silver Jubilee. To commemorate the occasion and to encourage more contacts with



The Poddle Steamer Industry' is a state historic museum, built in Gooolius, S.A. and commissioned in January 1911 as a sucreptout for the South Australian Engineering and Water Supply Department playing a major part in keeping the river open for traffic by remounty straigs.

The Wireless Institute of Australia (S.A.) Division gratefully acknowledges the support of the Paddle Steamer "Industry" committee, the Murray Pioneer, Riverland Newspaper and Printers and the Riverland Tourist Association.

5N-land, also to show the amateur radio community and friends around the world what NARS has achieved in the last 25 years, the Society will issue the above special award to any licensed amateur/SWL who works/hears amateur radio stations in the Federal Republic of Nigeria during 1986 under the following conditions.

For stations located outside Nigeria five points are necessary.

These points are established as follows:

Contact with each 5N station — one point
 Contact with a NARS club station — two points
 All modes, all allocated amateur bands

Send a list of contacts or log extract showing details of contacts/SWL reports, witnessed by two licensed amateurs. Contacts between January 1 and December 31, 1986 are valid for this award. Cost is ILISS for an air mail return.

Cost is US\$5 for an air mail return. Address applications to: the Awards Manager, PO Box 2873, Lagos, Nigeria or PO Box 27522, Concord, Cal 94520, USA.

AMATEUR PROJECTIONISTS

Information is required from Commercial Theatre Projectionists who are also amateurs with a view to a comprehensive article for Amateur Radio. Considerable interest has already been shown from replies to a Hamad placed in August's AR, but more is required.

All interested amateurs should contact VK3AH, QTHR.

FLYING THE FLAG

The flying of the Australian flag at radio displays has not gone unnoticed. Sam Vk2BVS, was recently presented with a Certificate of Appreciation by Sir Colin Hines, President of the Australian National Flag Association, at a special ceremony at ANZAG

House, Sydney.

Amateur radio made 100 new friends that evening as Sir Colin's words were broadcast over the 147 MHz repeater, to the delight of the VIPs that attended the presentation.



Electro-Magnetic Compatibility Report



Electro-Magnetic-Compatibility difficulties are as old as radio communication. When G Marconi (Radio Amateur No 1) first operated more than one transmitter, QRM (interference) resulted. It became necessary to invent the "tuned circuit" to restrict the transmitted frequency spectrum and to improve the receiver selectivity. Now, about 90 years later, we are still dealing with the same

Transmitter frequencies or channels and power levels are laid down in "recommendations" at world radio conferences of the *International* Telecommunications Union (ITU). These are at least partially adopted by the various national governments. Amateur radio frequency bands are also subject to the same ITU resolutions, which are largely adopted by national government authorities like the Department of authorities like the Department of Communications (DOC) in Australia, the FCC in USA, the FTZ in West Germany, etc. These resolutions cover the basic responsibilities and rights of all telecommunication transmitting services.

We now have a continuously growing number of electric/electronic services, appliances and apparatus which are not supposed to radiate electro-magnetic energy and which are not meant to transmit on frequencies allotted to telecommunication services (like amateur radio, government services, radio, television, etc). If such radiation occurs, it can cause interference and should be illegal. Appropriate standards define in some countries the maximum permitted power level and testing method for radiations. Only radio services which violate international regulations, are likely to cause interference (jamming stations, woodpecker). A legally operated transmitter is not likely to cause interference, as long as transmitter and receiver standards are matched. Preference must be given to services which involve public safety and government business. Little more can be done on the transmitter side of any telecommunication service. Transmitters will always need effective aerials and adequate towers or masts (whether these are liked or not) and the permitted power level to fulfill their intended function. If legally operated transmitters affect receivers, amplifiers, or electronic signal processors, it may be likened to rain leaking through the roof. Do you stop the rain, or do you fix up the bad roof? There are two kinds of receivers:

1. Electronic Apparatus or Devices, which are not supposed to receive legal radiation from communication transmitters, which have not been designed to be radio receivers, but whose intended function may be adversely affected by acting as receivers due to bad design.

example is a car cruise control affected by the transmitter of the car radio telephone). Television, Broadcast, Video Recorders. Preamplifiers and Accessories which should have enough selectivity/immunity to receive only transmissions from television or broadcast transmitters for which they are intended. acceptably immune to transmissions from other frequency channels for which they are not designed, so that legal transmissions cannot be blamed for affecting their operation. If affected, only the receiver design (lack of selectivity), or in some cases non-linear

devices nearby, may be held responsible. Only the establishment, adoption and policing of adequate immunity standards for receiving and amplifying equipment of all kinds can result in technically correct, fair and just compatibility of transmitter and receiver services. There is a wide spread popular view, still held by some members of the legal profession, that the unwanted signal reception effect can simply be stopped by closing down the transmitter. "They try to stop the rain, instead of fixing the leaking roof!" Stating that according to Common Law the legal transmission causes a "Public Nuisance," is an outdated logic, technically wrong (as admitted by some manufacturers), unfair and unjust.

More and more governments and appliance manufacturers recognise that receiver designers/ manufacturers can and should contribute to solving or avoiding the ever increasing number and variety of EMC problems. The required knowhow and technology has been developed long ago and is available in all countries. Much of the ground-work has been done by the EMC Commission representatives of the Association of Electrical Engineers (VDE), the West German Standards Association (DIN), the electronic industry, the FTZ (DOC), the German Amateur Radio Club (DARC, about 50 000 members)

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during years of meetings and technical work.
The measuring methods and EMC standards

became West German law in 1981. In September 82, the Australian Minister for Communications stated (as the law in West Germany already required) that the new Communications Act would probably specify standards for transmitters and receivers, and make it an offence to supply, possess or import equipment which does not meet the standards. The US President and the Senate signed into law at the same time the authority for the FCC to develop effective EMC standards. Nothing else will be of practical value!
It is hoped that these communication laws will

also cover the Amateur Radio Service, as in West Germany where the law "G-1239-A" dated June 2. 1980, as special law, pre-empts the common law The latter could be used unfairly against radio amateurs. Every effort should be made to ensure that the public, and especially the legal profession, see EMC problems in a logical, technical and fair manner. Co-operation of all concerned can usually overcome or at least reduce the problem without court cas

To make the public aware of the EMC problem and the legal EMC standards, and to protect customers who intend to purchase a broadcast set, television set or Hi-Fi amplifier, etc the FTZ and the second second in the second s services this type of apparatus has been tested to, and which unwanted effects lower EMC grades may produce. The government undertook to educate the customer — obviously a beneficial step. This is also "free advertising" for well made products, and should be supported by fair-minded manufacturers.

The proportion of the population who are radio amateurs is a definite indication of the stage of technological development a nation has attained Peace-time emergency services and especially the war-time contribution rendered by the selftaught and privately financed Amateur Radio Service shows the importance of this activity. The practical experience of radio amateurs, supplementing formal engineering training, is often of benefit to the electronic industry.



Book Review

30 Moore Street, Box Hill South, Vic. 3128





interest in aerials.

THE ARRL ANTENNA COMPENDIUM — VOLUME 1 **Published by the ARRL**

The Antenna Compendium is not your complete antenna book. It is not intended to serve that function, but rather, it is a collection of material of interest to antenna experimenters. Much of this material has not been published previously.

Antennae from 160 metres to 10 GHz are covered in the Compendium with Quads, Log Periodics, Verticals and Dielectric Antennas some of the antennas covered. Even antennas which work below the ground are covered. Treatment ranges from the highly practical aspects of making an antenna to mathematical analysis. However, don't be frightened by the mathematics - the practical details more than make up for the maths.

Material is backed-up by an extensive bibliography so that you can explore interesting topics further. There is even one item submitted by an Australian amateur. Summing up the Antenna Compendium provides some interesting and thought provoking material. It is a book for the amateur who has an



HEEL AND TOE GROUNDERS Plastistat heel and toe grounders establish a

ground path between mobile personnel and conductive flooring. In the absence of this grounding mechanism, electro-static voltages on moving people can reach levels as high as 12 000 to 35 000 volts. The grounders dissipate static to zero voltage in less than 0.1s in all levels of

The heel grounder is comprised of a conductive rubber heel cup, two Velcro straps and a conductive, fabric band. This design fits a variety of mens and womens shoes including boots, flat soles, safety shoes and joggers.

The toe grounder is comprised of a conductive toe strap attached to an elastic fabric band, and provides effective ESD for most types of footwear.

Abridged from Electronic News, p26 — April 1986

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AMSAT Australia

Colin Hurst VK5HI 8 Arndell Road, Salisbury Park, SA. 5109

OSCAR-1Ø APOGEES OCTOBER 1986

| | | APOGEE | CO-ORDI | | 1 | INEY | BEAM HE | | | RTH | |
|-------------|----------------|--------------------|------------|------------|-----------|------|---------|-----|-----------|-----|--|
| | ORBIT | U.T.C | LAT | LON | AZ | EL | AZ | EL | AZ | EL | |
| | # | HHMM:SS | DEG | DEG | DEG | DEG | DEG | DEG | DEG | DEG | |
| ist | | | | | | | | 16 | | | |
| | 2482 | 1121:49 | | 152 327 | 83 | 27 | 98 | 16 | 262 | 4 | |
| 2nd | | | | | | | | _ | | | |
| | 2484 2485 | 1848:51 2228:23 | -14 -14 | 142 318 | 89 | 19 | 95 | 8 | 267 | 12 | |
| 3rd | Octo | ber | | | | | | | | | |
| 276 | 2486 | 8959:54 2139:25 | -14 | 133 | 94 | 11 | 198 | 8 | 272 | 21 | |
| 4th | Octo | ber | | | | | 200 | • | 2/2 | | |
| 277 | 2488 | 8918:56 2858:28 | -14 -13 | 124 299 | 99 259 | -1 | 266 | , | 277 | 29 | |
| 5th | Octo | ber | -10 | | 237 | -1 | 200 | | 2// | | |
| 278 6th | | 2017:30 | -13 | 298 | 264 | 6 | 271 | 17 | 283 | 38 | |
| 279 | 2493 | 1936:33 | -13 | 280 | 269 | 14 | 277 | 25 | 291 | 46 | |
| 7th | | | | | | | | | | | |
| Bth | Octo | 1855:35 ber | -13 | 271 | 274 | 22 | 283 | 33 | 381 | 54 | |
| 281 | 2497 | 1814:38 | -13 | 262 | 280 | 38 | 291 | 41 | 316 | 61 | |
| 9th 282 | 2499 | 1733:41 | -13 | 252 | 287 | 39 | 366 | 49 | 337 | 66 | |
| Øt | h Oct | ober | | | | | | | 4 | | |
| 11ti | 25/01 h Oct | 1652:43 ober | -13 | 243 | 296 | 47 | 313 | 56 | 4 | 67 | |
| 284 12t1 | | 1611:46 ober | -13 | 233 | 307 | 54 | 331 | 61 | 38 | 65 | |
| | | 1530:48 | -13 | 224 | 323 | 68 | 353 | 64 | 48 | 59 | |
| 13t1 | h Oct | | | | | | | | | | |
| 441 | h Oct | ober | -13 | 215 | 345 | 64 | 17 | 63 | 61 | 51 | |
| 287 | 2589 | 1408:53 | -12 | 205 | 9 | 65 | 37 | 59 | 78 | 43 | |
| 15t) 288 | 0ct | 1327:56 | -12 | 196 | 32 | 61 | 52 | 52 | 77 | 34 | |
| l6ti | h Oct | ober | | | | | | | | | |
| | 2513 h Oct | 1246:59 | -12 | 187 | 48 | 55 | 63 | 45 | 83 | 26 | |
| 298 | 2515 | 1206:01 | -12 | 177 | 61 | 48 | 72 | 37 | 88 | 17 | |
| | 9517 | 1125:84 | -12 | 168 | 78 | 46 | 79 | 29 | 93 | 9 | |
| 911 | h Oct | ober | | 100 | / 6 | 40 | / * | 27 | 7.0 | , | |
| 292 | 2519 | 1844:86 | -12 -12 | 158 334 | 77 | 32 | 85 | 21 | 98 268 | -2 | |
| | h Oct | | -12 | 334 | | | | | 200 | -2 | |
| 293 | 2521 | 1883:89 | -12 | 149 | 83 | 24 | 96 | 13 | | | |
| | 2522 t Oct | 2142:48 ober | -12 | 324 | | | | | 265 | 6 | |
| 294 | 2523 | 0922:12 | -12 | 148 | 88 | 15 | 95 | 5 | | | |
| | 2524 Uct | 21Ø1:43 | -12 | 315 | | | | | 276 | 14 | |
| 295 | 2525 | 6841:14 | -12 | 139 | 43 | | | | | | |
| 295 23r | 2526 0 Ct | 2828:45 ober | -12 | 386 | | | 264 | 2 | 275 | 22 | |
| 96 | 2527 | Ø8ØØ:17 | -12 | 121 | 98 | - 1 | | | | | |
| | 2528 h Oct | 1939:45 | -11 | 296 | 262 | -8 | 269 | 18 | 281 | 38 | |
| 297 | 2530 | 1858:48 | -11 | 287 | 267 | 7 | 274 | 18 | 288 | 39 | |
| 25t) | 0ct | ober 1817:51 | -11 | 278 | 272 | | 288 | 24 | 204 | 47 | |
| 6t1 | h Oct | ober | -11 | 2/8 | 272 | 15 | 288 | 26 | 296 | 47 | |
| 99 | 2534 | 1736:53 | -11 | 268 | 278 | 23 | 287 | 34 | 388 | 55 | |
| | 2536 | 1655:56 | -11 | 259 | 284 | 32 | 296 | 42 | 324 | 61 | |
| 8t1 | h Oct | ober | | | | | | | | | |
| 191 19t) | 2538 0ct | 1614:58 ober | -11 | 249 | 292 | 48 | 386 | 49 | 346 | 65 | |
| Ø2 | 2548 | 1534:01 | -11 | 248 | 361 | 47 | 328 | 56 | 11 | 65 | |
| Øt! | 2542 | ober 1453:#3 | -11 | 231 | 314 | 54 | 338 | 68 | 33 | 61 | |
| 118 | t Oct | ober | | | | | | | | | |
| 84 | 2544 | 1412:06 | -11 | 221 | 331 | 68 | ø | 62 | 56 | 55 | |

NATIONAL CO-ORDINATOR Graham Ratcliff VK5AGR INFORMATION NETS AMSAT AUSTRALIA Control: VK5AGR Control: VKSAGR
Amateur Check-In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.85 MHz — Summer: 7.064 MHz
AMSAT PACIFIC
Control: JATANG
1100 UTC Sunday

2200 UTC Saturday Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGMENTS Contributions this month are courtesy Bob VK3ZBB, Graham VK5AGR, and AMSAT-Telemail.

OSCAR-10 STATUS

OSCAR-10 STATUS

As reported in last months column, OSCAR had been affected by radiation exposure and had suffered operational difficulties. Through the diligent work of Karl DJ42C, in rewriting the OSCAR-10 software, a new operating system, IPS-C4, was uploaded to the spacecraft to return it to an operational condition.

At the time of preparation of this column the At the time of preparation of this column the onboard computers memory has had another cosmic "hit" and the inoperational condition is with us again. It is hoped that by the time you are reading this, the spacecraft will once again be

operational SUCCESSFUL LAUNCH OF OSCAR-12/ JAS-1

The Japanese Amateur Satellite, JAS-1, was successfully launched on August 12, 1986 at 2045 hours. In recent months, this column has carried the general specifications of the spacecraft.

This month, we have the technical descriptions inis month, we have the technical descriptions and appropriate formulae for the telemetry systems and the operational details for the Packet Radio experiment being carried on JAS-1. WARNING!!!

WARNING!!! It is my understanding that JAS-1 has an overload detection system incorporated in the spacecraft section system incorporated in the spacecraft release for general usage, the overload cloudly will automatically switch to an alternate mode, egrorn Analogue Transponder Operation to Digital Transponder Operation, should excessively HIGH INPUT signats be detected in the passband HINPUT signats be detected in the passband in the passband. requested that uplink signals be limited to ensure that the downlink is no stronger than the beacon on 435,795 MHz.

on 435.795 MHz.

Therefore, be warned, that should the transponder switch off — you may have been the irresponsible person who caused it! Just in case you think only the Americans and Europeans are the alligators within the OSCAR-10 passband just semperors witnin the OSCAR-10 passband just tune through the passband. The current Austra-lian alligators on OSCAR-10 who migrate to OSCAR-12/JAS-1 are going to achieve significant notoriety when they shutdown the transponders.

JAS-1 CE Telemetry Calibration Equations Format of CW (at 20 WPM) telemetry on:

Therefore, CW telemetry has 20 channels of data and each channel is made up of three digits. The numbers 1 to 5 shown above indicate channel numbers, and each letter (A, B, C, and D) stands

| while the rest (4A to 5D) indicates status points to be described below. | | | | | | * Paramet | | Equation 20.0 * (N | | | 3A Battery Temp 3B Baseplate Temp # 1 3C Baseplate Temp # 2 3D Baseplate Temp # 3 | | 1.50 1.50 1.50 | 1.50 * (62.0 · N) deg C 1.50 * (62.0 · N) deg C 1.50 * (62.0 · N) deg C 1.50 * (62.0 · N) deg C | |
|---|---------------|-----------------|------------|----------------------------|---|-----------|---|-----------------------|----------------|---|--|---|----------------------------|--|--|
| The Analog Telemetry Data The number in each channel represents a two digit Decimal number; ie in the range 00 to 99. example: 123> number is 23 (decimal)> | | | | 18 1C 1D 2A 28 | 1A Total Solar Array Current 18 Battery Charge/Discharge 1C Battery Voltage 1D Half-Battery Voltage 2A Bus Voltage 2B + 5 V Reg Voltage 2C JTA Power Output | | 20.0 ° (N + 4.0) mA 40.0 ° (N - 46.0) mA (N + 4) ° 0.22 V (N + 4) ° 0.20 V (N + 4) ° 0.06 V 2 ° (N + 4) ∧ 1.618 mW (N + 4) / 50 V | | | Statu | s Telemetry D. | ata Forma | | | |
| N = 23. | | | 2D | 2D Calibration Voltage # 1 | | | (N+4)/50 V | | | | | | | | |
| OSCAR-19 NOVEME | | | BE | APOG 7 19 | | | | | Each the fo | fore, only five bit represents llowing table. | the vario | s are valid as data. us status shown in | | | |
| | | | SATEL | | I | | BEAM HEA | DINGS- | | I | note: | ISB (Least S | ionificant F | Birth. | |
| DAY | ORBIT | APOGEE U.T.C | CO-ORDI | NATES LON | AZ SYI | DNEY | ADELA | IDE EL | AZ PEI | RTH | bit 4 is | MSB (Most S | ignificant E | Bit) Bit) : 11010 (Binary) | |
| * | # | HHMM: SS | DEG | DEG | DEG | DEG | DEG | DEG | DEG | DEG | bit 0 (L | | 2 (Octai) = | 11010 (Binary) | |
| ist | Nover | shen . | | | | | | | | | bit 1 bit 2 bit 3 | 1 0 | | | |
| 362 | 2546 | 1331:09 | -11 | 212 | 352 | 62 | 22 | 68 | 61 | 47 | bit 3 bit 4 (M | | | | |
| 2nd | Nover | nber 1250:11 | -18 | 263 | 15 | 62 | 48 | 55 | 78 | 39 | Ch Bit | | 1 | 0 | |
| 3rd | Nover | ber | | | | 0.000 | 0000 | | | | • | | | | |
| 307 4th | 255Ø Nover | 1289:14 | -18 | 193 | 35 | 58 | 53 | 49 | 77 | 31 | 4A 0 4A 1 4A 2 | JTA Power JTD Power | On On | ON | |
| 398 | 2552 | 1128:16 | -18 | 184 | 5Ø | 52 | 64 | 41 | 83 | 22 | 4A 1 4A 3 4A 4 | Eng Data #1 Eng Data #2 JTA Beacon | PSK | cw | |
| 5th 369 | Novet 2554 | 1847:19 | -10 | 174 | 61 | 44 | 72 | 33 | 88 | 14 | 40.0 | | On | Off | |
| 6th | Noves | ber | | | | | | | | | 4B 0 4B 1 4B 2 4B 3 4B 4 | UVC Level Battery Status Battery Logic Main Relay | 1 Tric | 2 Full | |
| 31Ø 7th | 2556 Noves | 1996:21 ber | -18 | 165 | 70 | 36 | 78 | 25 | 93 | 6 | 4B 3 4B 4 | Battery Logic Main Relay | Tiric On | Full | |
| 311 | 2558 | 0925:24 | -10 | 156 | 77 | 28 | 84 | 17 | 98 | -2 | | | Bit 1 (LSB) Bit 2 (MSB) | | |
| 311 8th | 2559 Novem | 21#4:55 ber | -18 | 331 | | | | | 263 | -1 | 4C 0 4C 1 4C 2 4C 3 4C 4 | PCU Status PCU Control Eng Data #3 Eng Data #4 | Manual | Auto | |
| 312 | | Ø844:27 | -18 | 146 | 83 | 20 | 98 | 9 | | | 4C 4 | Eng Date #4 | | | |
| 312 9th | 2561 Novem | 2623:58 | -10 | 322 | | | | | 268 | 7 | 4D 0 4D 1 4D 2 | Memory Unit #1 Memory Unit #1 Memory Unit #2 Memory Unit #2 Computer Power | On On | Off Off Off Off | |
| 313 | 2562 | Ø8Ø3:29 | -18 | 137 | 88 | 12 | 95 | 1 | | 200 | 4D 2 4D 3 4D 4 | Memory Unit #3 Memory Unit #3 | 2 On 3 On | Off | |
| 18th | 2563 Nove | 1943:ØØ | -18 | 312 | | | | | 273 | 15 | | Computer Power | | | |
| | | Ø722:32 | -18 | 128 | 93 | 4 | | | | | 5A 0 5A 1 5A 2 5A 3 5A 4 | Memory Select Memory Select Eng Data #5 Eng Data #6 Eng Data #7 | Bit 1 (LSB) Bit 2 (MSB) | r. | |
| 11th | | 1902:03 | -10 | 383 | | | 267 | 4 | 279 | 23 | 5A 3 | Eng Data +6 | | | |
| 315 12th | | 1821:Ø6 | -9 | 294 | 265 | 1 | 272 | 11 | 285 | 32 | | Solar Panel #1 | Lit Lit | Dark Dark | |
| 316 | 2569 | 1748:88 | -9 | 284 | 278 | 9 | 278 | 19 | 292 | 48 | 58 0 58 1 58 2 58 3 58 4 | Solar Panel # 1 Solar Panel # 2 Solar Panel # 3 Solar Panel # 4 | Lit Lit | Dark Dark Dark | |
| 13th | Nove | mber 1659:11 | -9 | 275 | 276 | 17 | 284 | 27 | 382 | 48 | 5B 3 5B 4 | Solar Panel #4 Solar Panel #5 | Lit Lit Lit | Dark Dark | |
| 14th | Nove | mber | | 2/5 | | | | 2/ | 302 | 48 | 5C 0 | CW Beacon | CPU | TLM | |
| 318 15th | | 1618:13 | -9 | 266 | 282 | 25 | 292 | 35 | 314 | 55 | 5C 1 5C 2 5C 3 5C 4 | Source Eng Data #8 Eng Data #9 Eng Data #10 | | | |
| 319 | 2575 | 1537:16 | -9 | 256 | 289 | 33 | 301 | 43 | 332 | 68 | 5C 2 5C 3 5C 4 | Eng Data # 10 Eng Data # 11 | | | |
| 16th | | mber 1456:16 | -9 | 247 | 297 | 46 | 312 | 59 | 353 | 63 | 5D 0 5D 1 | Eng Data # 12 | | | |
| 17th | Nove | mber | | | | | | | | | 5D 0 5D 1 5D 2 5D 3 | Eng Data # 12 Eng Data # 13 Eng Data # 14 Eng Data # 15 | | | |
| 321 18th | 2579 Nove | 1415:18 mber | -9 | 237 | 307 | 48 | 327 | 55 | 17 | 62 | 5D 4 | | | | |
| 322 | 2581 | 1334:21 | -9 | 228 | 321 | 54 | 345 | 59 | 36 | 58 | JAS-1 | PSK Telemet | ry Calibra a Format | tion Equations SS | |
| 19th | | mber 1253:24 | -9 | 219 | 338 | 59 | 6 | 59 | 51 | 51 | JAS-1 | FF YY/MM/DE | HH:MM: | SS | |
| 28th | Nove | mber | | | | | | | | | XXX XX | (X XXX XXX XXX (X XXX XXX XXX | XXX XXX X | XX XXX XXX | |
| 324 21st | 2585 Nove | 1212:26 mber | -8 | 209 | 359 | 69 | 26 | 57 | 62 | 44 | | X XXX XXX XXX S SSS SSS SSS S | | | |
| 325 22nd | | 1131:29 | -8 | 288 | 28 | 59 | 42 | 52 | 70 | 36 | | rame Identifier | | Realtime Telemetry — | |
| 326 | 2589 | 1050:31 | -8 | 191 | 37 | 54 | 54 | 45 | 77 | 27 | | | | | |
| 23rd | | mber 1889:34 | -8 | 181 | 51 | 48 | 64 | 28 | 82 | 19 | | | Bina SA: 8 | ry Stored Telemetry — | |
| 24th | | | -0 | 101 | 51 | 48 | 64 | 38 | 82 | 17 | | | SB: 8 | Stored Telemetry — | |
| 328 25th | | Ø928:37 | -8 | 172 | 61 | 41 | 72 | 30 | 88 | 11 | | | MO:N | ry dessage + 0 dessage + 1 | |
| 329 | 2595 | Ø847:39 | -8 | 162 | 78 | 33 | 78 | 22 | 92 | 2 | | | | ressage # 1 Aessage # 9 | |
| 26th 33Ø | | mber Ø8Ø6:42 | -8 | 153 | 76 | 25 | 84 | 14 | | | | | MIG.N | nasaaya + a | |
| 338 | 2598 | 1946:13 | -8 | 328 | /0 | 23 | 04 | 14 | 266 | ø | HH:M | M/DD = Date M:SS = Time | (UTC) | | |
| 27Lh 331 | | mber Ø725:44 | -8 | 144 | 82 | 17 | 89 | . 6 | | | The fo | ollowing is valid | d only for F | RA and SA frames. | |
| 331 | 2600 | 1905:16 | -8 | 319 | 02 | 17 | 07 | | 271 | 8 | xxx = | 000 - 999 | Forn (Ana | nat: 3 digit decimal ilog Data) | |
| 28th 332 | | mber 8644:47 | -8 | 134 | 88 | ы | 95 | -2 | | | | | 27 si 0 thr | nat: 3 digit decimal dog Data) amples in row 0 column u row 2 column 6 oted # 00 - # 26 below) Byte Hex (System us Data) | |
| 332 | 2602 | 1824:18 | -8 | 310 | 00 | | 73 | - 2 | 277 | 16 | y = 0 - | F | (den One | oted #00 - #25 below) Byte Hex (System | |
| 29th | | mber 8683:49 | -7 | 125 | 93 | 1 | | | | | | | Stati 9 sai | us Dara) mples in row 2 column 7 | |
| 333 | 2684 | 1743:21 | -7 | 300 | 70 | | 278 | 5 | 283 | 24 | | | (den | mples in row 2 column 7 row 2 column 9 oted • 27a - • 29c | |
| 30th | | mber 1702:23 | -2 | 291 | 268 | 2 | 276 | 12 | 289 | 33 | s = 0 c | r1 | Bina Bina | w) ry Status Data amples in row 3 thru row | |
| | | | | | | • | 2.0 | | / | 33 | | | 30 8 | ampies in row 3 thru row | |
| Page | 52 - AM/ | TEUR RADIO | October 19 | 86 | | | | | | | | | | | |

idenoted #30a - #39c JAS-1 Telemetry Calibration Equations 00 Total Solar Array Current 1.91 * (N-4) mA 3.81 * (N-264) mA N - 0.0210 V N * 0.0192 V N * 0.00572 V N * -0.00572 V N * 0.0116 V

50 Total Solar Array Courset

O Battery Change O'Change

CO Battery Voltage

CO Battery Voltage

CO Battery Voltage

CO Battery Voltage

CO + S V Registery Voltage

CO + S V Registery

C 5.1 * (N - 158) m/A 5.4 * (N - 116) m/A N / 500 V N / 500 V N / 500 V 0.139 * (889 - N) Deg C 0.139 * (889 - N) Deg C 0.139 * (689 - N) Deg N / 500 V 0.38 * (N - 684) Deg C 0.38 * (N - 684) Deg C 0.38 * (N - 690) Deg C 0.38 * (N - 683) Deg C 0.38 * (N - 683) Deg C

Temperature Calibration N / 500 V Temperature Calibration N / 500 V

JAS-1 System Status Telemetry Bytes Ch # Item 27a Spare (TBD)

27b Spare (TBD) 27c Spare (TBD)

28a Spare (TBD) 28b Spare (TBD) 28c Memory Unit #0 error count 29a Memory Unit # 1 error count

29b Memory Unit #2 error count 29c Memory Unit #3 error count

JAS-1 Binary Status Data Points Ch w Item

30a JTA Powe On On PSK 31a UVC Status 31b UVC Level 31c Main Relay On Ċn 32a Engineering Data # 1 32b Battery Status 32c Battery Logic

33a Engineering Data +2 33b PCU Status 33c PCU Status Bit 1 (LSB) Bit 2 (MSB) 34a Memory Unit # 0 34b Memory Unit # 1 On Bit 1 (LSB) Bit 2 (MSB) Off On Off

37a Engineering Da 37b Solar Panel # 1 38a Solar Panel #3 38b Solar Panel #4 38c Solar Panel #5 39a Engineering Data +6 39b CW Beacon Source CPU TIM 39c Engineering Data #7

IAS-1 RA 86/08/01 09:00:00 *** *** *** *** *** *** *** *** *** XXX XXX XXX XXX XXX XXX XXX 000 004 yyy Ots sss sss sss sss sss sss sss sss sss Real time ASCII frame sent on 86/08/01 at 09.00.00 UTC

Total Solar Array Current = 947 mA Memory Unit # 0 error count = 4 JTA power off JTD power on

JAS-1 Packet BBS User Interface Information Mailbox Commands (Basic users training) Summary
 1.1 Available commands

F: List files addressed to all or to current user M. Main

V. VIII Blok M: List file/s to/from current user

R: Read file/s W: Write file 1.2 Command syntax The general format is: < a command letter >

<space> <argument>. At least one blank is required between <a command letter> and y argument > 2. Command Prompt

JAS-1 Mailbox supplies a prompt "JAS>" with no
CR or LF to indicate that the system is ready to

accept a command from the user.

A user can "type ahead" commands while JAS-1 is sending messages or data to the user. JAS-1 will execute the commands in the waiting queue later.

3. Commands
3.1 The "F" Command
F = FILES. Shows the latest 10 files the first time

it is entered during a session. Subsequent 'F commands will list the next 10 active files (messes). A message posted to multiple users has in its 'To:' destination field. See also the command described below. example:

JASSE MO

TO DATE EROM CHRIST ADSENE produte F8ZS DL3AH 116 Abgleich AFREG anleitung der JA1RL WAZLQQ JA1DSI JAS-1 new schedule ALINS for Phase-3C Who manages HK0XX QSL? 113 Harry in P-3C countdown #8 NMCR AMTOR 110 All mailbox now O 103 inme JRIFIG 102 10000 N7FDA RS-232c card for PC-

JAS>F

GORUH IR1FIG 100 10/08 Sara ni kogata no TNC AFDEM-JA # 3 in JAITUR 00 10/08 All progress
Call for papers
TCP/IP on TAPR NNC KA9Q NSAHD Automatic tracking system IPS-RA 10/07 DJSKO All hancemer Wettersateliten RUDAK-Statusrepo Now QRV on JAS-1 93 DB208 3.2 R <file #1>, <file #5>, <file #8> <file #2>. <file #3>.

R = READ/ Read file/s (messages) specified by file number/s you got from the 'F' command. Up to eight files can be specified. example:

JAS > R 95 102 Posted: 86/10/08 17:33 UTC

From: N5AHD To: JR1FIG Subi: Automatic tracking system

Dear Saya, Thank you for your compliments on the manual you received from G3AAJ. Two computers are

now used - one for control of antenna system radios, and so forth and another one is used for the actual data capture. The system now allows several satellites to be selected and data ports. tracking priorities, modulation mode, and things to be associated with each. I have been working on a couple of articles describing the new system and would be glad to send you copies

when I am finished. 73, Robert. J. Diersing, N5AHD Posted: 86/10/09 03:21:42 UTC

From: N7FDA To: JR1FIG, JA1JHF

Subi: RS-232c card for PC-1089

I need one more RS-232c card for my old faithful PC-1089. Would you ask Kanawa san if he could still get one in Akihabara? Mik

3.3 W (call1, call2, call3, , call7, call8) W ... Write Send message (file) to others. As

many as eight destination addresses can be specified. The part of the command line in brackets (call1, call2, call3 . . .) is optional. A message without specific destination is "public", io address to "All

The JAS-1 mailbox will then prompt you to send the subject field by sending "Subj:". You can send a subject field with up to a 32 character string.

After receiving the "Text:" prompt, you enter the message text, ending each line with <cr>
(carriage return), You terminate with either a <01> <01> or < cr> < ct1-7 > < cr>

(ie a line containing only a period or a control-Z) to indicate end of your text.

example: JAS > W N7FDA Subj: Roger, wait for a while.

Roger, I'll immediately call him up and get an info for your "Main Frame". I am going to put that info during next orbit.

3.4 K <file # 1>, <file # 2>, <file # 3>,

<file #7>. <file #8> K = KILL! Delete file/s (messages) specified by

file numbers. The <file #> is the same one described in R command. Up to eight files can be specified in a command line. A user can only delete files addressed solely to himself (ie not to multiple users) or files he posted.

H = HELP! Entering H < cmd > gives additional information on that command. Entering only H will give a list of all available commands

2 C M

M = Mine, List the latest 10 files (messages) that are either to or from the current user. Additional M commands list additional active messages. This command will be useful to save channel time when that user only wants to see his messages.

JAS>M

DATE FROM TO SUBJECT 111 G3AAJ JR1FIG Harry in London Uchiawase wa raishuu? RS-232c card for PC 102 10/09 NIZEDA 100 IDHING JR1FIG Sara ni kogata no OF 1000 NEAMD IDIEIO

SATELLITE ACTIVITY FOR THE MONTH **OF JUNE 1986** 1. LAUNCHES

The following launching announcements have

been received: 174 1751 1752

1988-042A (16758) 1988-042B (16759) 1988-042C (16760) 1988-042D (16781) 1988-042E (16762) 1988-042F (16763) 1988-042H (16764) 1752 1986-042H 1986-043A 1986-044A 1986-045A 1986-045A 16767 16769 16772 16791 1757 USSR ne 12 ne 18 ne 19 1988-045A 1988-047A

2. RETURNS During the month 39 objects decayed including the following satellites:

1986-028A 1986-032A 1986-035A 1986-036A Cosmos 1739 Progress 26 Soyuz TM Cosmos 1744



HI HI from space .

Eight minutes late!
Wednesday, August 13, had amateur radio operators around the world listening anxiously for he first signs of life from the latest amateur radio Amateurs have used the Morse code letters HI

for decades to indicate laughter, probably because of the sound of the Morse letters: di di di dit di dit. It was fitting, therefore that the satellite radio transmitter would first send this message back to

Launched by the controlling body of amateur radio in Japan, the Japanese Amateur Relay League, JAS-1 Satellite was due to blast into space from the Tanega-shima Space Centre at 2031 UTC.

The satellite was carried as payload on the test launch of Japan's H-I launcher and, as such, did not attract the many millions of dollars fees commanded by other methods of launching. Even so, the satellite itself had to be funded ntirely by amateur operators.

With separation from the launch vehicle over Chile at one hour 10 minutes after launch, the first pass over Sydney should have been at 2248 hours UTC (08.48 am) Licensed radio amateurs employed by Dick

Chibbe and a matteurs omproyed by Dick Smith Electronics head office in Syndroy set up a special station using the DSE Amateur Radio Club's call sign, VK2DRS, to listen out for the telemetry signals from JAS-1, indicating all had gone well.

continually transmits Morse data on approximately 435.795 MHz, in the 70 cm amateur band. Operators at VK2DRS had some anxious moments as 2248 UTC came and went with no sign

of signals from space. Then, some eight minutes later, at 2256, came the sound of laughter everyone was waiting for: HI
HI, followed by groups of numbers as the
spacecraft transmitted data back to earth.

The laughter from space was echoed on the round as the amateurs realised all was well Within a few days the spacecraft would be

The club station VK2DRS/P listens for JAS-1 on the morning of August 13. Operators are Ross VK2KRT and Andrew VK2XKK. Photograph taken by Garry VK2YBX and presented coutesy Wendy Giles of Dick Smith Electronic



ready to act as a relay station in space, where amateurs from any country could call other stations around the world via transponders on the

And within a month or two, JAS-1 will become the first "Packet" radio repeater, allowing fully automatic, unmanned communication between amateur radio stations having the necessary computer equipment.

e equipment used at VK2DRS/P was a Yae FT-726R All Mode VHF/UHF transceiver with 70 cm and satellite options and an RF Aerospace SAT7018GR 18 element 70 cm Yaqi antenna. A Yaesu FR-7700 receiver was also used to monitor AMSAT's information service from the US on 20 metres

EASY RTTY/CW OPERATION The MFJ-1224 Computer Interface, a small neat

package which hooks-up between a radio receiver/transceiver and the users compr designed to make RTTY, CW ASCII and AMTOR operations a breeze It is supplied com te with CW and RTTY

oftware to suit the VIC-20 and C- 64 computers. but its versatility allows it to be used with almost any personal computer providing it has the appropriate software. Additionally, the unit is fully AMTOR compatible when used with a computer equipped with AMTOR software. e MFJ-1224 can copy on all the standard

shifts — 170 Hz, 425 Hz, and 850 Hz plus other shifts between and beyond. When running the 170 Hz shift a sharp eight-pole active filter is automatically switched in which very effectively cleans the majority of noise off the incoming signal. It automatically copies CW speeds from five to 100 WPM and up to 300 Baud on BTTY



A unique feature of the 1224's design allows it to copy on both mark and space tones, which greatly improves copy during adverse conditions. A built-in automatic noise limiter helps suppress static crashes and provides better copy whilst a Normal/ Reverse switch eliminates retuning while stepping rough various RTTY speeds and shifts Other features also include a +250 volts DC output to directly drive a RTTY machine, a

speaker output and an easy to use two LED tuning indicator system For further information please contact the Australian Distributor, GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone: (03) 873 3777

RECEIVE SIGNALS FROM AROUND THE WORLD ON A SCANNER With the addition of a small \$99 box, your

programmable scanner can now listen to signals om the other side of the globe.

Manufactured by GFS Electronic Imports, the

new Worldscan shortwave and broadcast converter for programmable scanning receivers (complete with a supplied three metre wire antenna), can add hours of listening pleasure to

your scanning operations.

The Worldscan is smaller than a cigarette packet, runs from its own in-built nine volt battery and simply plugs into the antenna socket of the scanner. The host scanner can then cover an additional frequency range from 300 kHz to 25 MHz. This makes it possible to listen to local AM broadcast stations as well as hundreds of overseas AM broadcasters who use the shortwave bands. These stations include the Voice of America and the BBC

The Worldscan's output frequency range is from 120,300 to 145,000 MHz so that, for example, a 7.500 MHz shortwave signal would be found on 127 500 MHz

For further information please contact GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone: (03) 873 3777.

A CONNECTOR THAT ABLY ACCOMMODATES BIG AMP OUTPUTS A new audio connector system from Utilux has set

an industry standard by providing a solution to the problems of amplifier-speaker connection that have been growing since the 60s with the growth in loudspeaker wattage.

The Utilux UX series of high power audio connectors has the ability to reliably transmit signals with a dynamic range from micro-volts to a hefty 30 amperes. Since the 60s when audio amplifiers w considered "low level signal" - around 20 watts

- audio amplifier output powers have been gradually increasing to today's high levels, commonly exceeding 1000 watts and often reaching 3600 watts. Over the years, amplifier output connectors

have remained largely unchanged. Increasingly powerful and sophisticated equipment has continued to bear the inadequacies of banana plugs and phone jacks developed in the 'low signal 60s.' This has meant not only signal impedance, but electrical safety standards were often dangerously compromised by very high amperage. The UX series provides high current, large

cable (8 x 14 mm) capacity with no risk of shortage or of electrocution. Terminated to 10 AWG cable. connector temperature does not rise above cable temperature even with 30 ampere continuous load The system comprises two parts — a cable end

connector — UX100 — and a panel mount connector — UX500. To accommodate existing standards, the UX500 has the same cutout profile as an XLR type female socket. Two UX100 connectors can be mated for cable-to-cable connection, or one UX100 can be mated with one UX500 for cable-to-equipment connection. A genderless format cleverly defies Murphy's

Law in either connection by ensuring correct polarisation and the impossibility of a mismatch. Amplifier to speaker connections in the UX system are positively identified by a distinctive oval shape measuring 17 x 24 mm.

The UX system can be easily assembled using a soldering iron and screwdriver. Contacts are supplied separately, soldered to the cable by the user, and then snapped into the connector body. This facilitates equipment assembly and avoids melting the insulator when soldering to heavy cable Fully assembled, the connectors provide the

highest level of safety with total insulation between contacts and the metal shell. The connector contacts are formed from a copper-iron alloy and silver- plated (or gold-plated to special order) with a total contact area of 30 mm squared and solder cup for up to 3 mm diameter conductors. As specified in IEC safety standards, the contacts cannot be shorted connections and are finger inaccessible to prevent

electric shock Inherent in the connector system is also a superior robustness, combining rugged die-cast



alloy construction with positively latch locking and a super-strength stainless-steel bar cable clamp. Both flat and round cable can be secured to withstand up to 30 Newton pull out force.

Offering audio professionals a connection system of the same high calibre as their amplifiers and loudspeakers, the Utilux UX series provides not only a long sought quality but an opportunity to finally standardise this area of common practice.

For further information please contact Utilux Pty td, 14 Commercial Road, Kingsgrove, NSW.



LASERS TO ETCH MICROCHIPS in the traditional process for manufacturing ICs, as

many as 100 individual steps may be required. Each step increases the risk that the finished product will contain some flaw that renders the chips unusable. Depending on the size and complexity of the chip, less than half of the finished wafer may yield acceptable chips, leaving the surviving chips to recover the entire cost of fabrication.

Not surprisingly, IC manufacturers are constantly seeking ways to improve yield and reduce costs. In one new technique, a laser used as a photo- etching device scans the surface of a silicon wafer in the presence of certain gases. Under static conditions, these gases have no effect on silicon; the energy of the laser, however, decomposes the gases into compounds that define active elements and interconnects by either into compounds that etching away unwanted material or by deposition onto the substrate. The source and drain regions of a transistor are made by doping the silicon with phosphorus, which the laser creates by breaking molecules of phosphine gas. Hydrogen chloride, which serves as an etchant, is activated by the thermal energy of the laser beam. Interconnects on the chip are made by similarly decomposing gases that contain tungsten, nickel, and

One of the major incentives for this new method is a national program, led largely by the Departments of Defences and Energy, to develop new classes of super-computers. Much of this work has been done at the Lawrence Livermore National Laboratory, where experiments indica that the technique can produce as many as 1000 transistors per second. At this rate, it would be possible to fabricate super-computer chips — consisting of about 100 000 transistors each — at the rate of one per day.

Other exciting possibilities include repairing damaged high-value chips and turning a new design into a prototype chip in one day or less, as opposed to today's turnaround time of one to four -Reprinted from ham radio, July 1985

WAFERSCALE INTEGRATION This technique uses the surface of a silicon wafer

to implement an entire functional capacity. Examples include complete 32-bit microprocessors. with memory and all relevant I/O functions, a "silicon" hard disk with 20 MB of storage, RAM speed, and all disk controller functions on a single water

WaferScale integration promises to make very complex functions available in a single package. But this improvement is not without peril. Because of the large amount of circuitry and the extensive processing required on such devices, any mistake in fabrication results in a very expensive piece of scrap. Also, the large number of circuits and functions possible with WSI makes packaging considerations a major concern; it may be necessary to have hundreds of pins on a very complex functional element — more than can now be accommodated. However, the general benefits of WSI seem to justify the complexities of making such devices, and within the next few months the first few WSI products are expected to be announced. - Pagginted from ham radio links 1986

Pounding Brass

Marshall Emm VK5FN Box 389, Adelaide, SA, 5001

Helio again, and welcome to October (he says checkly, writing in early August). Well, first of all, a reminder that the kintonia Sprints are place on Saturday, November 15. The full rules should be in the Contests Column little most have been done to Contest Column little most have been done to Keep it Simple has been done to Keep it Simple takes think endousy about having a bean at take a lot of times, it should be good tun, and containly provide as to d'a chaileage density and a containly provide as to d'a chaileage density and a containly provide as to d'a chaileage density and a containly provide as to d'a chaileage density and a containly provide as to d'a chaileage density and a containly provide as to d'a chaileage density and a containly provide and the density of the containly provide and the containly provided to the containly p

My reasons for preferring a start at any number are threefold. First, a zero takes a long time to send in Morse. Not all operators, and specifically not all of the slower ones, use the " to represent zero, so a start at, say 500, can save a bit of time where zeros are sent. Second, (and I admit this has limited relevance. but it includes yours truly) some keyers have a facility for penerating contest numbers, but the first digit cannot be a zero. Third, and most important, if everyone starts at 001 it is easy to see where one stands in the contest at any given time. Ian thinks this is a good thing, but Ian is a very competitive contester. I think it tends to discourage late starters and slower operators. If you do not know where you stand you may continue longer than if you know you don't have a hope of catching up. Anyway, there it is, and we will see how a reversion to free numbering works

in the Sprinte Now I promised to write about the Adelaide Hills Amateur Radio Society's visit to the OTC Coast Radio Station (Adelaide Radio) at McLaren Vale. Radio Station (Adelaide Radio) at McLaren Valle. For the benefit of the club members who were unable to visit the facility, the manager, Fred Reeve VKSYK, attended the Society's last meeting and spoke on the subject of the services provided by the CRS. It was a most enjoyable and informative talk, and if all CRS managers are of Fred's calibre, it would be well worth any club secretary contacting the nearest one.

First, the significance of all this in relation to this column, which, after all, is about CW operation and not commercial communications. From that point of view, you will be interested and perhaps as surprised as I was to learn that 85 percent of the traffic load at Adelaide Radio is CW or MCW! (MCW is modulated CW, where Morse code is sent using a modulated carrier so that equipm without BFOs; eq AM-only, can receive it). says two things to me - first, CW is far from dead in the maritime communications field, and second the CRS constitutes one of the few remaining professional Morse operations in the world. With the dependence on CW and the necessity of handling unscheduled operations with a variety of stations, it is more like amateur radio than any other communication field.

As you are probably aware, the primary role of the Overseas Telecommunications Commission is the operation of commercial communications services (telegrams, telephone, telex, facsimile) between Australia and other countries. It operates in parallel with Telecom Australia which has the responsibility for domestic communications. It follows that commercial traffic is the primary role of the Coast Radio Stations, but you will be pleased to know that all of the operators and staff regard Maritime Safety as their primary mission,

and commercial traffic as secondary.

Adelaide Radio has two operators on duty during the day, and one at night, and all emergency channels are monitored. The area of responsibility extends from the mid-point between Melbourne and Adelaide to half-way across the Melbourne and Adelated to nativeay across the Great Australian Bight, and there is some overlap with neighbouring CRS stations, 15 of which effectively ring Australia and provide 24-hour communications with ships at sea. Thus the CRS is usually the first to hear of any maritime emergency, and Ilaises closely with local Coastquards, Police, and the national search and rescue centre in Canberra. In its commercial role, a CRS station can

connect any ship at sea within its area of coverage with any person who can be reached by telephone, telegraph, or telex anywhere in the world.

The equipment necessary for Adelaide Radio's mission would bring tears to any amateur's eyes. Given top-line receivers for MF, HF, and VHF, the ransmitting power available to the single nighttime operator is pretty impressive. There is a 2 kW transmitter on MF, and three 1 kW, fully

synthesised transmitters on HF Maybe that does not sound like a lot of power (after all, 3 kW linears on the amateur bands are available overseas) but when you put a kilowatt into a CRS antenna it definitely gets radiated. The Adelaide Radio antenna farm covers 66 acres. It is a lot of real even 70 foot (20 metre) towers, and in the middle of it all is a 150 foot (46 metre) insulated, top-loaded tower which is itself the MF vertical radiator.

The other antennas comprise fans, folded dipoles, and cage quads. There is a copper earth mat 12 inches (30 cm) below the surface of the entire area, and you can imagine the amusement of the staff at the station when a state electrical of the staff at the station when a state electrical authority inspector complained that the 240 volt service was "inadequately earthed." And to top it all off, there are legal constraints against anyone building anything in the vicinity of the station, which is in farmland separated by hills from Adelaide, so there are no problems with RFI.

In case the 240 volts supply fails a diesel generator can supply adequate power for sustained operation at full power. It is the size of a small car, and if it were a little more portable, I think it would go well in the John Moyle!

The 600 ohm transmission lines run from the station to separate receiver and transmitter gantries, where baluns match them to 70 ohm coaxial cable for the rest of the distance (.8 km in coaxial cable for the real visual states of the receiving antennas).

All in all, Adelaide Radio is admirably located

and equipped to fulfill its mission. The only negative aspects were from the operator's standpoint, with fairly "antique" consoles, and the very common problem of having to upgrade technologies to support computers, satellite so on. But the main thing is that they are there; they make some traffic money for OTC, but far more importantly, they provide a lifeline for all the ships at sea. CU next month



GIPPSLAND GATE RADIO AND **ELECTRONICS CLUB**

The Gippsland Gate Radio Club has been the focal point of amateur radio activity in and around Dandenong, Victoria, for the past decade. In June 1986, there were some changes made within the Club and it is now known as the Gippsland Gate Radio and Electronics Club.

The original aims of promoting amateur radio communications are still maintained, but they now include the fields of Digital Electronics, Kit Building and Computers. The GGREC is a group of electronic enthusiasts

and radio amateur operators who promote all aspects of computers, hobby electronics and telecommunications. The Club features its own amateur radio station, a test equipment library and component sales to its members.

Monthly meetings are open to all ages and visitors are made most welcome. Meetings are held at 8 pm on the third Friday of each month at the 1st Oakwood Park Scout Hall, in Heyington Crescent, Dandenong,

Crescent, Usricerionis, Inquiries about the Club may be made in Inquiries about the Club may be made

DEVIL NEWS from the North-West There were 23 members and three visitors in attendance at the last meeting. Apologies were received from VK7s SE, OL, SF and Athol Gill.
Letters of thanks were read from the Boys Brigade, Apex and the Horse Trials at Ulverstone, for the communications help given to them by the

Club.
Several items were tabled for discussion, one of t was decided to use the club call sign VK7NW, for the camp station. Operations from Camp Quality will be from a caravan.

The QSL Bureau had another quiet month with very few cards being processed.

The committee have started thinking about the Hamfest which will be held on the North-West

Coast.

A WICEN exercise will be held next year in conjunction with an air pageant at Wynyard. This has the makings of a very interesting exercise. A warm welcome is extended to Malcom Prisstley, whose membership application was

accepted at the meeting.

The meeting concluded with a successful auction of radio discards. Everyone managed to purchase something they did not want, thanks to a good auctioneer!

good auctioneer! The RAD repeater will shortly be installed on top of Mount Duncan. A working party has already made the arduous climb to install the housing for it on August 10. The party consisted of VK7s ZAP, ZAM, AX, WP, WN, OM, ZBT, and WJ, with Andrew VK7ZAP, in charge.

They assembled at the Penguin High School at around 9.45 am and proceeded to the walking track in four wheel drives and a utility. A variety of materials were then transported to the peak via the backs or hands of the party. Ross VK7WP and Noel VK7NW carried the large and bulky steel

housing for most of the trek Approximately two and a half hours were spent working on and inspecting the equipment already

The hardy adventurers had an eventful trip back down the mountain due to two trekkers taking a wrong path halfway down and proceeding for some distance before realising their error. At the base another two headed in the wrong direction in a four wheel drive but were able to find their way eventually.

Notes compiled by Max Hardstaff VK7KY and Greg Stammers VK7ZBT

WAGGA CONVENTION

As mentioned last month, the Wagga Wagga Convention is to be held over the weekend, October 25 and 26, 1986. It is expected to be an interesting and rewarding weekend for all who

attend.

The program commences early on Saturday with displays, fox and hidden transmitter hunts with displays, for any industrial maintains and vintage equipment for sale, steam engines and trade displays. There will be attractions to interest amateurs, SWLs, hobbyists and family members. Several of the leading equipment suppliers have booked stands and shall be displaying the most

booked stands and shall be displaying the most modern equipment available today. Demonstrations of Packet Radio, Satellite TVRO, AUSSAT, ATV, and RTTY have been arranged and it is hoped to have people in attendance who will be able to give information and answer questions on the various aspects of each display

each display.

The Conference Dinner will be held on Saturday evening. This year, the guest appairs for the American Conference Dinner will be held on Saturday evening. This year, the guest appairs to the Conference Dinner Saturday on the Conference Dinner Saturday on the Conference Dinner Saturday on the Conference Dinner Saturday Sa

Events and activities will continue on the Sunday with prize giving and closure timed early to allow for those who have to travel long distances on the homeward journey.

Accommodation, on site, is available in bunks, or tent and caravan sites. This is available free of charge but reservation will be on a first come basis and payment of the registration fee. A limited number of bunks and sites are available.

Accommodation is also available in many of the numerous motels in Wagga Wagga. A number of motel units have been booked at this time, however, it is not foreseen that there should be any shortage of this type of accommodation. Reservations can be made by contacting Peter or Kevin. A special price will be available at selected

Tours of the city and local attractions have been arranged for those not as keen on the amateur radio side of things. Shops in Wagga are all open on Saturday mornings until 12.00 noon, and many remain open to 4.00 pm.

Registration fee will be \$10 per participant or imily registration. The site for the convention is family registration. The site for the correction OURA, located 10 kilometres from Wagga Wagga. Communications on the day will be via repeaters 146,750, 438,675 MHz, or on HF 3,613, 7,165 or 28,490 MHz. The club holds a regular sched on 7.165 MHz at

midday on Sundays. More information may be obtained, if required, at that time.

—Peter Clee VK2KZZ, Publicity Officer, Wagga Convention

WESTERN AND NORTHERN SUBURBS ARC Inc The Western and Northern Suburbs Amateur

Radio Club Incorporated, (previously the Western Suburbs Radio Club) holds its general meetings at 8 pm, on the first Friday each month at the Ern Rose Memorial Pavilion, Seaver Grove, Reservoir. Club nets are held each Tuesday on 145.450 MHz FM at 0930 and on 28.470 MHz USB at 1030 UTC. VK3IYP (International Year of Peace) is the

CLub call sign for 1986. Officer Bearers for 1986 are President: Mark Stephenson VK3PI Vice-President: Stan Taylor VK3DHN Treasurer: Gordon Hall VK3YOD

FAX FACTS

-Submitted by Tom Page VK3AGH. Secretary

Demand for facsimile machines in Australia continues to rise and is expected to reach 30 000 in use this year and an estimated 100 000 by 1990. use this year and an estimated 100 000 by 1990. Industry sources say businesses are rapidly recognising that FAC provides an inexpensive and quick means of document exchange. It skes 30 seconds to send an A4 document by FAX for the cost of a local call, or STD for long distance, compared with Total thing file meaning at a cert. compared with Telex taking five minutes at a cost of \$2

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Phone: (02) 689 2417 11 am to 2 pm M to F and 7 to 9 pm Wed

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CLUB PORTRAIT

NORTH EAST RADIO GROUP

Jim Linton VK3PC 4 Ansett Crescent, Forest Hill, Vic. 3131



The key elements of the North East Radio Group (NERG) are cheek, friendliness, activity and success. It is based in Melbourne's north-east suburbs, filling the geographic need for a radio club in the area.

NERG began when a number of radio amateurs, going to the annual Queen's Birthday Weekend Mount Gambier Radio Convention, in 1983, decided to form a club with the pure aim of

1983, decided to form a club with the pure announcing the Convention's inaugural trophy. The founders of the Group include Greg Williams VK3VT, Ewen Templeton VK3BMN, Paul and Brenda McMahon VK3DIP and VK3CIT, Gerff and Brenda McMahon VK3DIP and VK3BRN, Greg Hudson VK3CGH, Ian Bryce VK3BRY, Greg Ahpee VK3BZQ, Gary Carlson VK3KBL, John and Victoria Griffin VK3ZGT and VK3BNK, and Hank

De Jong VK3BLI. Along with their blatant, premeditated scramble for club status, they had the cheek to pick a nam not unlike the Convention's host club, the South

Radio Group (SERG). NERG Secretary, Greg VK3VT says: "It was a stir to the SERG — there's certainly a friendly

rivalry between the two groups now."

NERG won the Mount Gambier Convention Club Trophy in 1983, and again in 1984 — then SERG dropped it from their program! The Club Trophy was awarded to the club with the highest overall coints score in normal events being held. plus two others - antenna raising and a wheelbarrow race

wheelbarrow races.

NERG's winning streak continued at Mount Gambier with Greg VK3VT, winning the overall individual points score in 1985 and Richard VK3CRH/7CG, the 1986 winner.

The Group's other successes include the John Moyle Memorial Field Day Contest, which it first entered in 1984 to be runners-up, but in each year since has been section winner — and top scorer in 1986.

NERG club NERG club meetings began in the Montmorency High School in 1983. An attempt is made to keep administration low and activity high and stay a friendly club.
The NERG attempted to work the Astro-Amateur,
Owen Garriot W5LFL, in December 1983, only to be disappointed. They then produced an Owen Garriot dummy and publicised through the VK3BWI Broadcast for anyone who missed the Astro-Amateur to come to a NERG meeting and

nake the dummy's hand. Occasionally NERG has a construction night when they get someone who has made a particular item to come along and show everyone

The Victorian Fox-hunt Champion for the past eight years has been a NERG member and it has been said that NERGs are Australia's supremos of Direction Finding. The Group hold quarterly Sunday Afternoon Fox-hunts, mainly on HF, for those who want to get their feet wet in DFing. However, one readily suspects they use these trials to keep up their level of skill! Planning is advanced for the 1987 Victorian Fox-

hunt Championships, in February, which the Group says it is again organising to find the top Victorian Fox-hunter and to have a good time. Novices classes were started in 1984, because



the Group felt there was a need in that area and to simply promote amateur radio. The classes produced seven novices, and therefore seven new nembers in the first year, and there is a class of five in 1986.

Promoting the hobby is something the NERG do well and it has been the only club to volunteer and operate the Science Museum Demonstration Station, VK3AOM, on a regular basis.

One thing about the Nerg's 50 members is that most are active in club affairs, and are not just on the books as financial members.
Their approach to JOTA is somewhat unique. It

set up a number of booths containing activities such as direction finding, sniffer hunting, radio teletype, HF operating and Morse code. The idea is for each booth (event) points are awarded and the top scoring scout troop wins the award for the day. This way, they learn a little more about amateur radio than just operating a microphone. The Group was incorporated in 1985 due to the need to be a legal entity to enter into a lease

agreement for a tower. The NERG is moving quickly to establish its six metre repeater, VK3RMH, at Wattle Glen, as there are a number of six metre operators within the Group and it is hoped that the repeater will

encourage use of the band. And, what about the Group's emblem? Greq says: "We all think that's what a NERG would look like — a nice cuddly character who is fun to be with"

with The Group, heard on air as VK3CNE, also issues a bimonthly newsletter NERG News to keep its members informed.

For further information contact NERG, PO Box 270, Greensborough, Vic. 3088 or phone Greg Williams VK3VT, (03) 606 7478 BH or (03) 435 7870 AH

Any "RARE" recordings of amateur radio contacts for Volume 2 of "THE SOUNDS OF AMATEUR RADIO." are particularly interested in

recordings of contacts on bands not now available to Australian amateurs; eg 112 MHz, 288 MHz, etc. We are also looking for recordings of unusual contacts: ea from Balloons, Aircraft, Submarines etc. Any recording format can be handled

from cylinders to CD.

In the first instance please write to PFTER WOLFENDEN VK3KAU d- FEDERAL OFFICE CAULFIELD SOUTH VIC 3162.

PLEASE DO NOT SEND RECORDINGS.

Copies of Volume 1 "THE SOUNDS OF AMATEUR RADIO" are still available for \$7.00, plus post and packaging.

Inquire at your Divisional Bookshop or the Federal Office.



MOTORS An essential component of many motors is the

large, heavy permanent magnet associated with the non-excited elements of the motor. Magnequench, a new product developed by General Motors, is about 25 percent stronger than any other known magnetic material.

Currently, the most widely used high-power magnets, composed of samarium- cobalt, are expensive and difficult to manufacture. But the new material is so low in cost that the auto-maker plans to use the material on starter motors in some cars. Only five ounces of the material are needed

cars, only live outless on the maintain are necessified for the newly designed motors.

This tremendous saving in weight and size offers several benefits. Using a smaller, lighter starter, for example, simplifies design of the engine area. Using Magnequench instead of conventional magnets in all the control motors of a conventional magnets in all the control motors of a conventional magnets in all the control motors of a conventional magnets in all the control motors of a conventional magnets in all the control motors of a conventional magnets in all the control motors of a conventional magnetic mag car would presumably produce a measurable effect on fuel economy as well.

we duse samarium-cobalt is the material some-times used to make very small, high-performance loudspeakers, it should be interesting to see if the speakers manufacturers put in our HTs get any better as supermagnets become more widely available. Because samarium-cobalt is the material some--Reprinted from harm radio July 1986

AMATEUR RADIO, October 1986 - Page 57



VK2 Mini-Bulletin

DIVISIONAL NEWS

A vacancy has occurred on the Divisional Council.
Mary Jane Douglas VK2CMJ, has married and no wilves in the country near Coonamble. The distance made it difficult to carry out her council duties. Best wishes and thanks to Mary Jane for the feture. The "Gradent Straw" has been the future....The 'Broadcast Survey' the future. ... The "Broaccast Survey has been completed and a review given over the broadcasts. A written report will be included in a future Minibiletin. ... The call sign VK2AWI is to be reactivisted and will be used to provide identification for operation from Amateur Radio House. ... Scheduled activities in this coming month include the Divisional Dinner on Saturday, October 11, if the minimum booking level has been reached. Details have been given on the Broadcasts and last minute information may be obtained from the office during the hours 11 am to 2 pm weekdays or on Wednesday evenings 7 to 9 pm. Telephone (02) 689 2417...Members are reminded that the latest Australian Call Book is

available from the office, together with a range of amateur publications. Regrettably, the cost of the overseas publications has risen. . . A reminder that JOTA will be held over the weekend October 18 and 19. Contact your local group or the Divisional Office if you can assist. VK2WI will rebroadcast the opening address from Canberra at 2 pm Saturday, if we are able to receive a strong at 2 pm Saturday, if we are able to receive a strong signal to de so. .. The next Conference of Clubs will be held on Sunday, November 2. It was with regret that we learned of the passing, after a short illness in early August, of Brian Lavery, husband of our Administrative Secretary, Maureen. To Maureen and her family we extend our sympetty on behalf of all members.

WICEN This month there is the annual operation to This month there is the annual operation to provide safety communications to the Canoe Classic, conducted on the Hawkesbury River over the weekend of October 18 and 19. During this past year, the WICEN repeaters VKZRWS have undergone an extensive rebuild on the two metre side. New antennas have been installed and it is hoped that the original service area has been restored... The postal address for WICEN is via PO Box 123, St Leonards, NSW. 2065, or mail may be left at the office for redirection.

DAYLIGHT SAVING

A reminder that, with the change to daylight saying later this month, the VK2WI Broadcasts observe local time — that is 11 am and 7:30 pm.
The VK2TTY RTTY and VK2BWI Slow Morse
practice will observe UTC time. Their
transmissions will shift one hour by local time!

NEW MEMBERS FOR AUGUST

A warm welcome is extended to the following amateurs who were admitted to membership at the August Council Meeting: NJ Coleman VKZKJZ, North Sydney; R M Ellis VK2PGG, Lane Cowe; LN Lindsay VK2CLL Wauchope; CL McPherson VK2CLM, Por Macquarie; HM Pieremont VK2APD, North Port Sproule VK2XJS, St Ives.

SOUTH WEST ZONE CONVENTION The Wagga Amateur Radio Club advise that the Annual SWZ Field Day will be held at the same venue as last year, at the Scout Camp nea Wagga, over the weekend October 25 and 26. Further details may be obtained from WARC, PO Box 294, Wagga, NSW. 2650, or via the Sunday Box 294, Wagga, NSW, 2550, or via the Sunday Morning Broadcasts. While on Field Day dates, mark the Central Coast 1987 event for Sunday, February 22. This will be the 30th Annual Field Day on the Central Coast. The CCARC may be contacted at PO Box 238, Gostord, NSW, 2250.

PUBLIC LIABILITY INSURANCE FOR

CLUBS These notes were prepared in mid-August and at that time the interest and response to the proposed scheme had been poor.

VK2 DIVISIONAL LIBRARY Aub VK2AXT, the Divisional Librarian, would like

to thank the following for their donation of books and magazines: VK2s OZ; NL; JTR; YTQ; CQ; KYS; AUE and LW. Special thanks to Mrs Court and Mrs Garland, for the donations of books from their late husbands to the library.

A recent addition to the library is a listing of current equipment modifications, surplus equipment modifications and circuit information which is covered in amateur magazines. In

Tim Mills VK27TM VK2 MINI BULLETIN EDITOR Box 1066, Parramatta, NSW. 2150

addition, a list of instruction and overhaul manuals which the library holds for commercial and wartime surplus disposals equipme

This information is in a red covered folder on the OSL cabinet. If you intend purchasing a piece of equipment and would like to survey its performance data, call into the Parramatta office and look up the reference. Alternatively, you can ring (02) 689 2417 on either Tuesday when Aub is in attendance or on Wednesday evening when there is a Councillor on duty to ascertain if the review and/or the modification can be supplied. The library cross-reference indexing which

categorises articles appearing in amateur magazines into their respective group headings is currently being revised. This amendment covers all the articles appearing in the last 12 months of the various magazines.

The listing covering the library contents is also being progressively updated, with almost all the books now in the list. The popular magazines are now listed, but some of the rare and old issues are

now listed, but some of the rare and olo issues are still being audited and listed. The library has a comprehensive coverage of manteur books, electronic and computer magazines for your use. This coverage has been achieved by the many generous donations received, but to keep abreast of technology, there is still a need for books overing solid-state devices, application notes and technical books -new and old. The Librarian and Council is very appreciative of those who think of the library when disposing of unwanted literature and especial members who have the unpleasant task of posing of the estate of a silent key. This has been my mid-year report. If you have

any request we will do out best to supply the data -73 Aub Topp VK2AXT - Divisional Librarian

A new service for members, which is being added to the library facilities, is a photocopying service for some of the data books. The details are still being worked out, but in essence it will be only by mail since the material has to be located and Limit of three items and you will need to cover

the cost of return postage. By the time these notes appear, the conditions will be known. A copy may be obtained from the office or if you send in a SAE, a copy will be sent.



VK4 WIA Notes Bud Pounsett VK40Y

Box 638, GPO Brisbane, Old. 4001

It is inevitable that regular nets held by clubs or a wide flung group of individuals and conducted on HF, will run into interference problems. The ideal place for nets is, of course, VHF and particularly, the two metre band. This automatically prevents novices from joining in and, in a very large state like Queensland, limits the participants to those in a relatively small area. So it is back to HF with the popular choice being 80 metres.

Let us consider some practicalities. To start a net, we must set a time, that is, a particular day and time. We must choose a frequency and then publicise that frequency. Having told everyone that this is the frequency on which to meet, we are that this is the frequency on which to meet, we are stuck with it, plus or mirus a few kilchertz.

The time comes and there is the frequency— occupied! What to do? You can move up or down a little or you can ask the occupants to shift. Remember that this is not your frequency, so remembering this, you ask, in the most polite to the property of the content of the politic of the politic pol terms, for the occupants to shift and most times they will. If they refuse, drop the matter forthwith. On the other side of the fence, if you are on a aware of the net controller's predicament. By moving you will be showing the true amateur spirit. In Queensland, a favourite net frequency and one of our VK4WIA broadcast frequencies is 3,605 MHz. Here is a short list of nets and times when they are on, and as the phone-patch Americans used to say, a clear frequency would be

VK4 Disabled Persons Radio Club - Fridays, 0930 UTC on 3.590 MHz. Gladstone Amateur Radio Club — Thursdays, 0930 UTC on 3.570 MHz. Townsville Amateur Radio Club — Sundays, 0930 UTC on 3,605,4 MHz. Queensland Club Net — Tuesdays, 0930 UTC on 3 605 MHz Queensland Net — Thursdays, 0930 UTC on 3 605 MHz VK4WIA News Re-Broadcast — Mondays, 0930 UTC on 3.605 MHz. Gold Coast Amateur Radio Society — Wednesdays, 0930 UTC on 3,605 MHz.



NEW MEMBERS A warm welcome is extended to the following:

Alan Bergman VK3CHX; AB Burgess VK3FKA; Tony Capuano VK3NTC; Geoffrey Chamberlain VK3AZ; Dudley Hart VK3PDH; Brian Keegan VK3CTT/VK3KFB; I J Stanley VK3CIS; Ian Stowe; George Strachan VK3HS and Brian Hallam VK3DH.

ILLEGAL RADAR

Components for a device to jam police radar speed guns are being sold in Melbourne and an American car magazine is offering mail order plans for a jammer.
Use of these devices could, under the Radiocommunications Act, result in fines up to \$10 000, five years imprisonment, or both.

Five-Eighth Wave 🥪



Jennifer Warrington VKSANW 59 Albert Street, Clarence Gardens, SA, 5039

One of the "perks" of being President is being invited to visit some of the various affiliated clubs at their monthly meetings. Over the past couple of months, I have enjoyed meeting the SA ATV Group at their visit to the Educational Multi-Media Department, and the Adelaide Hills Amateur Radio Society at their Buy and Sell Night (from which I returned with a car load of "bargains" and a several of centimetres added to my waist-line from

the beautiful supper the ladies providedly.

More recently, I was invited to attend the Elizabeth ARC's AGM to chair their Election of Officers, and to draw their raffle. It was an "appalling" night (weather-wise) but inside the Water Tower on Kettering Road, the atmosphere was warm and friendly. The new committee of this

small, but very keen group, are as follows: President: Trevor Lowe VK5ZTJ

Secretary: Eddie Jennings Treasurer: Vince Schwinger VK5ZSV

nd the Committee Members - Sean Qui VK5KSQ, John Cooper, and Rex Haskard VK5HO Yet another magnificent supper (more centi-metres!) was provided by Hannah Jennings, Ed-die's wife. If you live in the Elizabeth area (or even till swine. If you wan till the Euclabert area (in even if you do not) and would like to join a friendly group, drop in at the Water Tower (Kettering Road, opposite GMH) any Wednesday night from 7.30 pm for general activities, or the first Saturday in the month for a meeting night, also from 7.30 pm. I

can assure you that you will b made most WOULD HAVE LIKED TO VISIT

One Club that I would have liked to visit in mid Winter (although I understand that even they did pletely escape the cold weather), was Darwin. They also have a new committee compris-

President: Bill VK8ZWM (better known, perhaps, as 'Spud', who I am told left immediately for VK4. Was it for advice or is the job really that bad,

Henry?).
The Vice-President is Barry VK8DI, (who shortly afterwards was seen in Adelaidel). All jokes aside, we were pleased to have you and your father with us at the Buy and Sell Night, Barry. Secretary: Larry VK8LM Treasurer: Trevor VK8CO

Station Manager: Frank VK8FT

One member who will be sorely missed, but nust deserve a well-earned rest, is Henry VKBHA. ou may remember that Henry was awarded a 75th Medallion for his services to amateur radio in Darwin last year, and now, as he leaves the Committee, he has been awarded the first Honorary Life Membership ever to be given by the Club.
The Club will be 20 years old in November, and Henry has served on the Committee for at least 15 Henry has served on the Committee for at least 15 of those years, not only doing the job of President, but at the same time being the QSL Bureau Manager, the Intruder Watch Co-ordinator, one of the Sunday Morning Broadcast relay operators (every week), Slow Morse Practice Operator (almost every night), Journal (Ground Wave) Congratulations Henry, you deserve it.

WHY NOT COME UP?

At this years Clubs' Convention, the Lower Eyre Peninsula ARC put forward a proposal that the frequency 3.579 MHz should be designated a "Home-Brew" frequency. We felt that although it was an interesting concept, it was not possible to make it 'mandatory' but that it should be public cised and encouraged (my applogies for having taken so long) so, you Home-Brew enthusiasts. understand that the crystals for this frequency are readily available, so why not come up and give each other a but of encouragement.

each other a but of encouragement. By the time you read this it will hardly be news, but on behalf of the Divisional Council and Members, I would like to thank Arthur Tanner YKSAAR, for volunteering to take over the job of Broadcast Producer. Each person brings to the job his or her own personality and no two are ever the same, so we look forward with interest to Arthur's etyle of production

OCTOBER MEETING

It has been suggested that the meeting on October 28, be one with a historical theme, and to this end it is suggested that you bring along your favourite piece of "olden day" gear (if you have revounce piece or order day gear (if you have one) and be prepared so say a few words about it. Also, at the June meeting, our Historian, Ray Bennett VKSRM, promised to return with a list of the "Duties of a Historian" which were discussed at that meeting. So, here is his compilation and it is suggested that you bring this list with you to the October meeting to discuss it further with Ray.

POSSIBLE ACTIVITIES OF AN HISTORIAN

(South Australian Division of the WIA) To accurately record for future reference

- those achievements in the art of amateur radio made by members of this Division, in the fields of VHF, DX, ATV, etc., etc.
- To prepare any publication or publi-cations of an historical nature which may be of assistance and interest to members of this Division.
- To bring such material as in 2 to the notice of members for their attention.
- To record any section of the material referred to, for future reference.
- To assist other Officers of this Division
- where inquiries of a historical nature are

required concerning activities of mer bers in the developments of amateur

- To prepare a short lecture for a selected monthly meeting, or whatever, if re-
- To assist officers and members of this Division in "Spreading the Gospel" of amateur radio as a worthwhile hobby.
- To assist the Historian/s of the other Divisions or the Federal Body in compilation of material, if requested -- Compiled by Ray Bennett VK5RM

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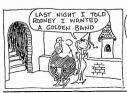
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Cartoon courtesy The Propagator





APPRECIATION FROM CHINA

APPRECIATION FHOM CHINA
The copy of Amateur Radio magazine received
recently with the detailed article, Introducing 814
Able Old Men. page 30, AR May 1986, sure put a
tan on my cheeks. Anyone who might read the
introduction would certainly have a complete picture of BY4AOM

A personal visit to the station would not add uch more information.

When I passed the article around to all the Old When I passed the article around to all the Old Timers, they gave a positive response and expressed their appreciation for the help in telling our old and new amateur friends that China's Old Timer Amateur Operators are still going strong and are back on the air again with an ever improving kick.
With the help of our old friend, Tom Wong

VETBC, we are putting together a linear amplifier with a two kilowatt input power. And if everything goes well, BY4AOM will be easier to copy in "the notest corners of the world" we hope. The band conditions these few months have not neen very good for DX from our location. We could hardly hear any VK-land stations recently and the Stateside stations came in with a 5 x 3 signal and only around 0300 UTC, which is not a very good time for both sides.

John Cieh, Chief Operator of BY4AOM, PO Box 227, Shanghai, China.

REFOMAN FUND

The Denis Reedman Fund has now been wound up and the following information is published for the benefit of members and donors.

Total Donations Received\$3702.59 Less Bank Charges, Stationery and Postage 9114 07 .\$3588.52 Cheque to Denis Reedman \$3578.20

Cheque to Salvation Army\$10.32 The amount paid to Denis covers his direct legal costs in full A big thank you to all who contributed collectively and individually to this appeal.

Sincerely,

Ron Swallow Greg Morrison Col Davidson VK2JCO PO Box 48 Gladesville, NSW.

FOR THE FIRST TIME I recently took part in the 1986 Remembrance Day Contest. It was the first time for me as I had my

licence for less than a year. The contest as a whole was a very enjoyable experience for me from start to finish. My operating was confined to the two metre band as that is all I have equipment for and my efforts were rewarded by 175 contacts. While this

may not sound like many, my time was divided between operating my own station and assisting the operation of a local radio club station. For me, there was only one disappointment, the For me, were was only one osappointment, the low number of operators actually participating in the contest. For example, the July 1986 edition of AR gives the number of limited call sign holders in VK6 as 216. Including myself, I heard only 10 of

these operators on the two metre band. A quick look at the VK6 Z-calls in the 1985-86
Call Book shows an overwhelming majority of these operators live in the Perth metropolitan area, thus making them quite accessible on two metres. If 50 percent of these people made the effort and took part in the contest there would be no need for the "work you again in two hours" clause in the rules as there would be more than

Over to You!

enough stations on the band to enable anyone to fill a decent log in a matter of a couple of hours. Incidentally, the number of unrestricted operators heard on two metres was equally disappoint-ing, but at least they had the excuse that they re operating on the HF bands. Or were they?

The RD Contest would have to be the easiest and most enjoyable on the contest calendar. It certainly gets adequate publicity — so how about it folks - next year just spend five minutes on the air and work your minimum of 10 stations and who

Just call CQ-RD and I will give you a number and so will all the others who took part this year. I am sure.

Alek Petkovic VK6ZAP, 26 Freeman Way, Marmion, WA. 6020.

AUSTRALIAN RADIO HANDBOOK

I am in complete agreement with Drew Diamond as to the need for a truly Australian Radio Handbook which would cater for the needs of VK amateurs. Hopefully any constructional projects included in such a handbook would specify components which can be obtained in this country within reasonable limits.
I am sure there are many radio amateurs who

are discouraged from venturing into homebrewing of instruments and equipment because of the difficulty in obtaining the components as specified in many overseas projects.

Also, with the increasingly high cost of equip-ment we could quite conceivably see a return to home construction of basic transceivers particul larly if good designs and instruction were avail-

I would like to see other amateurs derive as much enjoyment from this facet of the hobby as I do and I think more local content is required to encourage and foster interest in home construc-I would definitely buy a copy of such a hand

book, if it became available and I hope the response to this suggestion is sufficient to encourage publication of such an Australian Radio Handbook. Cordially yours Rob Abel VK2ERA.

106 Derwent Street, Glebe, NSW. 2037.

HELP REQUIRED

Three small items that I would like to comment on. First, the standard of AR is very good. You are doing a fine job and I like the paper quality.

Second, in answer to the letter from Drew Diamond. Please register me as a purchaser of a

Diamond. Please register me as a purchaser of a technical book if it is published.

Thirdly, I find difficulty in defining when the Australian prefix changed on three occasions. When I was first licensed in 1925 as 2JA, somehow I knew the prefix was A; ie A2JA. Then

on the grapevine, because I am sure that I didn't get notification, I became OAZJA. Then it became VK2JA, but I see many conflicts in the use of the three prefixes and I wonder if anyone know exactly when the A first come in and then the OA and later VK. I am very curious about it.

Arthur Mead VK2JM 13 Salisbury Avenue, Bexley, NSW, 2207. Can someone help Arthur, please. - Ed

A letter has also been received from Mrs TM Brown VK3DYF, expressing interest in an Australian Technical Handbook.

HALLEY'S COMET

I forgot to write, after seeing the QSP about Halley's Comet in June AR, but would like to record my recollections of seeing the Comet.

opinion expressed under this heading is the individua-nion of the writer and does not necessarily coincide with

I was just three, in May 1910, when my Mother took rile downstairs into the yard on a cold, clear morning to see Halley's Cornet. We had a clear view to the north-east and the Cornet appeared to fill the sky.

The tall streamed out behind it as I remember

on that date. Some may doubt that a three-yearold would remember it at all. I have had a standing loke with my friends for 50 years "that I want to live until 1986 and see Halley's Comet again." Well. I did, and this time I saw it 13 times — ten from my home address with binoculars (7 x 50)

and the others when I went on a bus tour in western New South Wales to Coonabarabran, Jilgandra, Narrabri, and Parkes. Two places had optical telescopes.

I believe the next sighting in 76 years will be a super-flop, but just wait another 76 years and it will be a "boomer!" Arthur Mead VK2JM. 13 Salisbury Avenue, Bexley, NSW, 2207.

REGULAR CONTACTS WANTED I am interested in setting up regular scheds with

an Australian amateur. I only have 80 watts and no beam antenna, so a regular sched would be my chance for something more than a brief DX-type OPO

I am very interested in learning more about Australia and it's people.
 My OTH is Spokane, Washington and I am married and 30-years-old.

Gary Stone KA7YXC, East 603 Empire, Spokane, Washington, 99207, USA.

EGO BOOSTING

I am continually surprised by some people, knowing little and saying much, who push themselves to the fore to boost their egos, unaware it has all been done before.

A prime example was the letter in July Amateur Radio headed "Emergency! Are we ready?" Yes, Sam, we are ready and have been for many years. It seems that you are deliberately ignoring past have always been able to handle emergencies as they have occurred. America certainly has never. as yet, played a vital part in any of our radio communications emergencies, so talking of

communications emergencies, so talking of America's vital role in Australia's emergencies is hog wash! seems that the expertise involved is of very low level. It clutters up two frequencies to pass low level. It clutters up two frequencies to pass traffic, when only one frequency should be used. Then the complaint about conditions, oh come on, all day every day? Sam really must have a poor receiver. Some stations, myself included, communicate with the USA and other overseas

stations daily. But then, of course, we are not black box operators! Regarding the Mexico City disaster, whilst appreciating the work involved in passing 600 messages via the telephone to the United States, I deplore the lack of expertise which necessitated deplore the lack or expertise which necesstated this action. During that emergency I was in touch with my friends in Mexico City via Radio Teletype and AMTOR 16 times. I did not rush to the Mexican Embassy and fall over myself to offer my services. Nor did I use the telephone to get my

traffic through. I used my radio as any experienced amateur would do. Further, I see that Sam is going to start a "mail rurner, see that sam is going to start a "mail drop," whatever that is? I presume he means mailbox. That is interesting, are mailboxes and AMTOR something new? Maybe for him, but then he has only recently purchased his black box. Others do keep up with the state-of-the-art, and

have been using AMTOR for the past five years. There has been a mailbox available for the last four years. It works very well, gives world-wide coverage, and is based in northern New South Wales. Why have a proliferation of mailboxes, especially when the operator has no idea of how it is supposed to work, nor of the protocol of the

There is already a mailbox within 2 kHz of Sam's proposed 7 MHz frequency. Sam will succeed only in creating havoc on the bands. It is a pity that amateur radio has descended to a level where black box operators can write such inane letters.

It would be much better if such people inquired about what has gone before and modelled themselves upon some of the "old-timers" who really knew what radio was all about. It would do them good to discuss communications and other matters with those who have experience and expertise. They must realise that many people know more than they do, are worth listening to.

know more than they do, are worth issening to, and willing to help others.

So to the Sams of this world, please make sure you know what you are doing to amateur radio, before you burst into print with a lot of inaccurate comments. Perhaps it is merely ignorance. If so lieten and learn

Yours respectfully.

Syd Molen VK2SG First AMTOR Station in Australia, Over 40 years on the Air, 13 Pendle Way.

Pendle Hill, NSW. 2145.

The above has been somewhat abbreviated and slightly censored. Syd's feelings have obviously been hurt! —Ed. DO YOU KNOW JOAN ELEANOR?

Do any readers have any details of the Joan Eleanor transmitter/receiver which was used by OSS agents operating inside Germany in 1944/45? The OSS required a radio that could operate securely inside Germany as opposed to those used by agents in the occupied countries which

cure and which required trained CW were not s operators. Wireless sets used by these agents survived in reasonable numbers but Joan Eleanor would be very rare.

It was designed by Steve Simpson and De Witt Goddard, who were officers with the OSS in London and in civilian-life were engineers with RCA. Simpson named the radio Joan Eleanor after two friends.

The only details I have are its size — 6.5 x 2.25 x 1.5 inches and weighing three-quarters of a pound. Power was by 'long-life batteries and it had a speaker microphone. The beam antenna opened out to one foot whatever that means. It required an open space in which to operate, which in view of its very high operating frequency and QRPp, is understandable. The 'modus

operandi' was to prearrange scheds as to time and larger, higher powered version of the Joan Eleanor

and with a then novel device — a wire recorder on which contacts were recorded for transcription back to the UK. Contacts were made via beams proj

vertically from the ground and downwards from the plane flying at 35 000 feet. This beam covered a circle at ground level of 40 miles. Once contact was made the aircraft had to fly inside the beam pattern of the ground signal to maintain contact. The system worked well in almost total security and a lot of important information was passed in this way but that is another story. I am interested in the technical aspect and would appreciate any information readers may have.

B Balley VK5KBY, 44 Charlbury Road, Medindle Gardens, SA, 5081.

LONELY BACHELOR AMATEURS Here is a recommended cure for lonely bachelor CW amateurs

Tune in to UZ0FWF on 20 metres any morning around 2230-2300 UTC and you are sure to meet any, or all, of the following: Helen, Eugenya, Natalia, Era, or Elena.

They alternate on the key. This is, apparently, a YL Club, with the QTH

being Korsakou, on Sakhalin Island, close to North Japan. All are nice girls and good CW operators. There is only one snag - all are very short on 88, in fact, they don't seem to have heard of such a thing!

"Mac" McBratney VK5YD, PO Box 151,

Blackwood, SA, 5051.

FOLLOW-UP PRACTICE Further to the letter from P H Gibbs VK3AQ, in

August 1986 edition of AR. I write to support his Amateur radio is open to all who comply with

the licensing requirements — thus there will be amateurs who are technically competent and to whom home- brew is a breeze, and there will be

amateurs who are less technically knowledgeable who need to be encouraged and educated.

The latter group need all the support they can reasonably be given within our fraternity.

Technical skills which are developed by home-brewing are one of the cornerstones of our hobby

and ha ve the potential to act as a national arce in time of trouble. I would encourage Divisions and the Federal Executive to pursue the matter of follow-up practical construction sessions further.

Yours sincerely,

not ruddy 'arf

Stephen Phillips VK3JY, 37 Mangarra Road. 37 Mangarra Road, Canterbury, Vic. 3126.

HAPPY WITH THE BLIP Going through my old Air Force books I came across a poem by Corporal B F Cottam published

on November 28, 1944 in Wings.
Those of us who were Wireless Mechanics at the time will appreciate the poem. Perhaps ex-

Corporal Cottam is now an amateuri Regards Noel A 49 Rows Harkw Noel Abel VK3YUO, 49 Rowallan Avenue, Harkway, Vic. 3806. 1

Happy with the Blip by Cpl B F Cottam Hil there "Troppo by the Swamp" and "Blanky by

the Sea And "Goin' Troppo down the South" — you all ist list to me You say, you're goin' troppo — that makes me ruddy laugh You ain't struck nothin' yet, me lads — no fear,

Now I'm a happy Signals Mech - ain't you 'eard o' that remark No! I don't live at Taronga Zoo nor yet at Callan

But I'm a guy what looks at blips and makes the ergs to flow, And then goes nuts and happy mit a fine bright

Yes! I'm a guy what looks at things when things ain't even there. And after when I'm off me shift I just sits still and stare.

Why! - Troppo! ! - Well! Gor strike me pink! it's just not in the race, With a fellow that's in Signals with a bright bliphappy face.

Blip-happy! Lor', yer dreams of things that make a man fair sick. You rant and rave and talk such rot they smites you mit a brick.
It's awful, blokes, it's crook, I says — so don't you

winge no more About your lot and what you do and things what

makes ver sore. 'Cause a fella that's in Signals, he puts up with a

With ossifers and blips and things that drive him off his dot; So please always remember - just take from me

this tip, Bein' troppo is a blessin' compared to "Happy

HOW TO KILL OR RUII D AN ORGANISATION

When conditions on the amateur bands are bad or there is a sunspot minima as we have at pres Institute activity generally seems to decline. It is at these times when one hears complaints, rumours and other wild mutterings. It is a cas hands get into mischief. This state of affairs is common with all organisations, and at some stage

or other when a general stasis applies a glorious lassitude pervades the membership in their attitude towards their club or organisation. It is similar with the WIA and it is now that members should be wary — they should be bestirring themselves to create interest and not kill it. The quickest way to "kill" any rehabilitation process is to adhere to the following ten rules (with to the US magazine *Popular* apologies Gardening):

1. Don't come to meetings, but if you do, come 2. Find fault with the officers and other members:

particularly on the ai 3. Never accept office: it is easier to criticise than to do things.

Nevertheless, get annoyed if you aren't appointed to a comm 5. If appointed, don't attend the committee

6. When asked to express your opinion, say nothing but afterwards tell everyone how things should be done. 7. When others roll up their sleeves to help, say

the Institute is run by a clique.

8. Never write a magazine article; it is too much of a bore

9. Hold back on your dues as long as possible, or don't pay at all. 10.Don't bother about getting new members, but if you do, be sure they are moaners like yourself.

Fortunately, we believe there are very few Organisation Killers amongst us, but in times of inactivity, beware. The Organisation Killer is an lous disease and can become an epidemic. We would like to believe that every member of the Institute was the direct antithesis of the Ok, and it does not really take any great effort to become so. Beware of that feeling of complacency become so. Seward of that teening of compliators that advises there are plenty of others to do the work. There is always some job in the Division you can do, and to quote the old proverb — Many hands make light work. Too often too much is left

to too few So we suggest that you offer your assistance to your Divisional Council and you will find them only too willing to accommodate you in some way don't be shy about coming forward to help wher ny about coming forward to help when assistance is required — you may find you may hold an important office yourself in the near future; become a real Organisation Builder and not a Killer

a Killer. htten by the WIA Federal Executive, Amateur Radio May

ERRATA

"Practical Earth Resistance Measurements" by George Cranby VK3GI (July, p 10). The author has asked us to make clear a number of points which, partly due to initial ambiguity and partly to editorial changes, are not

1. He makes no claim to have measured ground or soil conductivity, which is character-istic of a soil sample itself an independent of the electrode system. He has measured earth

rod resistances in different kinds of soils In the sentence beginning "This effective negated . . ." it would be better to continu earth leakage as a factor in the HV

system protection.

3. Additionally, there was a typographic error in the last line associated with Figure 1. The dividing line was omitted and the denominator (2) was misplaced. It should have bee By -R₁ + R₂ - R₃

AMATEUR RADIO, October 1988 - Page 61

Silent Kevs

IR LES BROWN IR HARRY BUCKLEY IR BILL DONOVAN IR JACK HARGREAVES I EN VELLA R G WEDDELL

VK3ARL VK3AHL VK6HB VK4AKV VK2DUL VK2DUL VK6AVL

Obituaries HARRY BUCKLEY VK6HB

HARRY BUCKLEY VK6HB I with to advise, with regert, that my brother, Herry passed savey on July 7 season of the process of the passed save of the passed of t

skiing and even archery.

JACK HARGREAVES VK2DUL JACK HARGHEAVES VAZUUL.
The death occurred at his home at Tumut
on June 22, 1986 of Jack, in his 79th year.
Although he had been in hospital on
occasions during the previous few months,
his death was sudden and unexpected.

He was born in Sudden and unexpected. He was born in Sydney on January 8, 1907 and spent his life in the Tumut district. Jeing a bachelor, Jack was a kind and sevoted uncle to his four nieces and five

devoted uncle to his root member of the mephews.

Jack was a toundation member of the Tumut and District ARC. His great love was radio and in 1992, after much study, he guined his full call. A significant so yard cheerful disposition will be sadly missed at club meetings, as will his voice on the Kookaburra Net.

OOKaburra ret:.
Jack is survived by his brother Arthur, of ydney. To him and his family and relatives, sepest sympathy is extended.
—Vince Nugent VK2ALZ

It is and to poor the audion passing of Lon on Australia Day, January 26, 1989, at York, Western Australia, at the young soo of St. Lon was born at St Julians, Malta on July Western Australia at the young soo of St. Lon was born at St Julians, Malta on July Long to the Communication Commission. Lot in 1940. Australia he worked for the Overseas Telecommunication Commission. He relited from Forming Island, Guam, Cairns, Sydney and Perth, and Immersed Misself in his hobby tarm at York, Western

Australia.

Len attained his amateur radio licence in 1981, and was a member of the Wila, AARTG and was Communications Officer for the local State Emergency Service in York.

He joined the Maltese Amateur Radio International Society and became a very active member with its international Net-

Len was married with four children.

I first met Len on July 12, 1954 whilst boarding a ship in Malta for the voyage to Australla. He was the Welfare Officer for the trip from Malta to Perth and he disembarked at Fremantie. Over the years we lost track one another until we made contact on the Len was married with four childre

air in 1981. I was then fortunate to restances with Len and his wi Leonie, when I visited Western Australia during a Round-Australia trip in April 1985. To Len's wife and children, the Maltese Amateur Radio fraternity world-wide extend their deepest sympathy.

Sam Galea VK2AKP/9H1GS
MARIS Area Director Oceania

BILL DONOVAN VK4AK\ It is with great sadness that I record the loss

it is with great sadness that I record the loss of my friend, and the friend of many, Bill Donovan VK4AKV, who passed away very suddenly at his home on July 6, 1986. I first met Bill some 23 years ago as a new call, VK42BD, on two metres, but I could not foresee then the many enjoyable hours I would spend rag-chewing with this limit of the product o

Although he did not come into the ama-ur field until relatively late in life, he did so eur field until relatively late in life, he did so vitih great activity, but still found time to do fulled with the WIA, Brisbane VHF Group not the Brisbane North Radio Club. The tater seeing fit to honour him with a life nembership for his services as President and Class Manager, in which office he lepted many to obtain their calls. Since the property of the country of and and greatly assisted at many antenna skinns and servicines.

nano and greatly assisted at many antenna raisings and servicings.

No matter how crowded our bands may be in the years to come, I have no doubt that many will find there will always be a large blank space that occurred when Bill

nt Silent Key. F Pettiford VK4ZAA

THOUGHT FOR THE MONTH It is never too late to be what you might have

been.

W.I.A. WINDBREAKERS

- Warm and Machine Washable

- Navy Blue with 8 cm (3") WIA Badge



 Sizes 12-24 INOUIRE NOW AT YOUR DIVISIONAL BOOKSHOP.



AMATEUR RADIO - What it's all about

Amateur radio is the use of radio communications in all its forms as a hobby. There is in excess of 16 000 licenced operators in Australia and about one million internationally. What is the difference between amateur radio There is a great difference between the two: CB

radio gives reliable communication for a limited radius with many restrictions on the type of equipment used whereas a licenced arr operator can operate with a wide range of equipment including television and radio-te equipment including television and radio-teletype with much more power levels on up to 20 different hands from broadcast stations to microwave

w far will you get with amateur radio? ferent bands have different ranges at various times of the day, the operators consider how far and when they wish to communicate and select an appropriate band to transmit on. In this fashi fairly reliable contact can be made to anywhere in Must you have a big antenna to operate? Not necessarily, antennas come in all shapes and

sizes for any given band, though a good rule is the higher the frequency you operate the smaller the antenna becomes and the less range you have. For most overseas communication large rotatable antennas are used as they give the ultimate performance but simple single wire antennas are guite effective What else can you do with amateur radio other than talk?

Talking to other operators is only one aspect of the hobby, operators are permitted to experiment with and construct their own equipment in many fields. ome examples are: RADIO TELETYPE: Usually called RTTY, this

mode allows communication by the typewriter keyboard using readily available ex-commercial AMATEUR TELEVISION: The transmission of colour or black and white television, both direct and via repeaters is an increasingly popular

SLOW SCAN TELEVISION: Allows one to transmit and receive pictures on black and white or colour from around the world. REPEATERS: For operators on the road, a system of over 100 repeaters on mountain tops across Australia receive and re-transmit signals to

greatly extend the range of mobile operations. QSL CARDS: Upon making contact with distant QSL CAHUS: Upon maxing contact with oistinos, it is customary to acknowledge contact by sending a personalised type of post card called a QSL card. Many operators make a hobby of collecting these cards from all over the world. These can be sent through the Wireless Institute of Australia's Divisional QSL Bureaus at moderate or no cost to members.

How do you become an amateur operator? To become an operator you must obtain a licence from the Department of Communications by passing a combination of radio theory, regulations and Morse Code examinations dependent upon which of three classes of licence you wish to obtain — either Novice, Limited or Full.

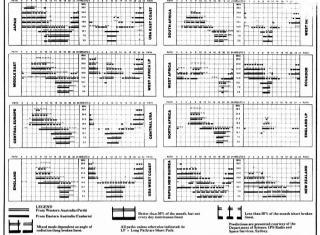
Examinations are conducted by the Department every three months. There are many courses run by the WIA, clubs and schools to assist with this. For details, contact the Department of Communi-cations, the WIA, or your local radio club. Correspondence classes are also conducted by the

Once established, the amateur can play as active a part in the hobby as desired. There is no way of knowing where this exciting pastime may

-Adapted from material supplied by the Gippsland Gate
Radio and Electronics Glub

Ionospheric Predictions

Len Poynter VK3BYE 14 Esther Court, Fawkner, Vic. 3060



FEES RISE

Mixed mode dependent on angle of radiation (long broken lines).

Radio communication licence fees increased from October 1, 1986 by an average of between seven and 10 percent, but in some instances, fees have been reduced. The Department of Communications (DOC) in

16 300 licenses in the amateur radio service, under the single listing of "Amateur Station" increased \$3 to \$26

CB licenses, which number 175 799 are now \$13 - an increase of \$1. Revenue derived from the use of the spectrum

is estimated at \$33,161 million - which compared with DOC's total 1986/87 budget of \$36.9 million, an increase of \$4.1 million or 12.5 percent. The Minister for Communications, said a

shortage of frequencies for land mobile services in Melbourne and Sydney meant that new applicants for use of mobile frequencies in these cities would either have to share a channel or pay a fee of \$2,130 for exclusive channel use. This will encourage the sharing of channels and other spectrum efficient practices. Full details of the new fee structure are available from DOC Offices in all State capitals

and District Radio Inspector's Offices in 20 regional centres. -Submitted by Jim Linton VK3PC

Federal Budget Press Statements said the

The solar activity was very low with no energetic flares observed. The visible disc of the sun was virtually without spots for the entire month, only small spots appearing for brief periods on the first and eighth. The low level of solar activity was reflected in the low value of the 10 cm flux, which

monthly average of the 10 cm flux was the lowest ne 10 cm flux readings were 1=69; 2.3=68; 4.5=67; 6-8=68; 9=69 10-13 = 68; 14 = 70; 15,16 = 69; 17,18 = 68; 19-21 = 67; 22 = 68; 23 = 67; 24-30 = 66.

The sunspot average was 0.8 and the running yearly average centred on December 85 was 15.4.

Solar Geophysical Summary GEOMAGNETIC

JUNE

since the last solar minimum.

he average was 67.5.

was caused either by a recurrence or was the result of a filament eruption on 22nd. A = 27,21.

From data supplied by Department of Science IPS Radio and Space Services — June 1986 reached a peak value of 70 on the 14th. The

DEADLINE

The month was generally quiet except for the period 27-28 when a minor storm occurred. This

All copy for inclusion in the December 1986 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300. Caulfield South. Vic. 3162, at the latest, by 9am, 20th October 1986

WANTED - SA

HAMADS are a FREE service to MEMBERS of the WIA

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PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write each on a separate sheet of paper, and include all details: og Name, Address, Telephone Number, on both sheets. Please write copy for your Hamed as clearly as possible. Please do not use

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rring only to private articles not being re-sold for erchandising purposes. ditions for commercial advertising are as follows: \$22.50 for four lines, plus \$2.00 per line (or part

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TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price teles and 10% accounts Selb Ce in A. U.S. May 20% and 10% a

WANTED - NSW

BLUE COVERED WILLIAM ORR RADIO HANDBOOK. Prop. Pitch motor. Valve bases for 813. Toyr TS-820S. Maurie VK2DCD, PO Box 72, Coleambally, NSW, 2707.

KENWOOD AT-120 ATU: for mobile installation. Cress VK2CC, QTHR. Ph: (02) 631 3186.

ROLLER INDUCTOR: 30 pH; in good condition. Philip VK2EPC, QTHR. Ph; (92) 660 6734. UTILITY X BEAM HUB CASTING: one wanted by VK2ALZ, OTHR. Ph; (069) 47 2198.

YAESU FT/780R: 70 cm all-mode or equivalent. Good price paid. Also 500 W antenna tuner wanted. Larry. Ph: (02) 949 3124.

WANTED - VIC

FRG-7000; FRG-7700; KENWOOD RI000/R2000; RE-ALISTIC DX 400 (not 302); ICOM IC R70: Any of the above to swap for complete CB station in very good condition. See sale ad Vic. John L30479. Ph: (056) 21 0846 AH.

INVITATION: to Clubs or Groups to supply details of their history, aims, activities & services so as a Club Portrait can be written as part of a series of profile articles in AR magazine. Please post information, including a c name & phone number to Jim Linton VK3PC, QTHR

KENWOOD MC-50 DESK MICROPHONE: Contact VK3OM, QTHR. Ph: (03) 560 9215. STURDY METAL TRIPOD: capable of holding antenna pole for small beam. 6m linear, (home-brew will do) & wind generator 12V suitable for portable use. Also neon sign transformer in working order. Ken VK3AJU. Ph: (03) 527 9029 or (03) 957 8054.

WANTED - QLD

ONE 690R: including or excluding matching PA. VK4JHM, PO Box 849, Atherton, Old. 4883. Ph: (070) 91 3219. INFORMATION: to put a SSB SBE-IV 23 channel CB onto 10 metres. Bill VK4VHD, QTHR. Ph: (074) 22 2695.

YAESU FT290R: 2m all-mode tovr. Must be in mint condition. Ivan VKSQV, QTHR. Ph: (087) 25 5514.

FOR SALE - ACT

70 cm LINEAR CORONA HP-120 UDX: with GaAsFET preamp. \$550. Toyko HP power 70 cm GaAsFET low noise mast-head preamp. \$260. Ralph VK1RK, QTHR. Ph: (062) FOR SALE - NSW

COLLECTORS ITEM: Radio & Hobbies in Australia magazines. Bound into year books for 1953-1954; 1955-1956. Also Radio & Television Hobbies in Australia for 1959. All bound for each year, comprising 5 volumes. Rest offer VK2URT OTHR. Ph: (043) 41 7693.

FT-200 TCVR: no mods, good condition. H/B power supply, manual, some spare tubes. \$200. Model 15 TPTR Exc condition. 110V xtrnr \$25. ST5 RTTY terminal. \$25 VK2ALZ, QTHR, Ph; (089) 47 2198.

ICOM IC-740: FM module fitted. WARC bands & PS-15 riginal supply. Hand mic & desk scan mic. All in perfect condition. Manuals. \$1090 ONO. VK2BPO, QTHR. Ph: (02) 713 1831 AH or (02) 568 2085 BH.

ICOM 740 HF TCVR: \$650. Icom PS15 power supply. \$110. Yaesu FC700 ATU. \$95. Icom SM2 desk mic. \$30. All equip as new & with manuals. Peter VKZDEH, QTHR. Ph: (02) 452 4301.

ICOM IC-R71A RX WITH FM: Dressler active ant. Emtron ATU, microwave modules, 2 & 6m converters. \$1100. Ph: (049) 69 4281.

KENWOOD R-2000 COMMS RX: ex cond. No mods, no faults, \$560. Kenwood TS-7850, 50W FM 2m to-r. Approx 6 months old. \$550. MFJ-1224 RTTY modem. Suit Com.64. Ex cond. \$260 ONO. Steve VKZKSR. Ph: (02.)

PEARCE SIMPSON AM; SSB; CB: with power mic plus handbook to modify to 10m band. 385. Micliand homes port a modified 2 of CB. Very compact (AM) 365. AMA and the second of the second sec

QUAD: 2-bands, 10 & 15M, 2 el. Wooden cross arms, wire elements, no matching devices. On a 6' tubular boom. Buyer to remove, \$40 ONO, VKZAXT, QTHR, Ph: (02) 635

SATELLITE ANTENNA SYSTEM: 2m, 2 x 8 el. Incl phasing harness, left or right-hand circ polarisation. 70 cm, 2 x 14 el. Incl phasing harness, left or right-hand circ polarisation. Fibreglass stacking boom. \$450. VK2BKQ, polarisation. Fibreglass QTHR. Ph: (02) 848 8781

TRIBAND BEAM CE-35LX: still in box, new \$320. CV TRIBAND BEAM CE-3SLX: Still in Dox, new: 3320. CW auto keyer \$15. 2m conv. \$25. HF linear amp; suit FT7. \$220. O/D telephones \$25. Valves; tx & rx all types. WWII middlector \$60. All items ONO. All types books; AR, 73, CQ best offer. Ph; (043) 96 4553.

YAESU FT-ONE & TUNER: both in perfect condition. Tour complete with optional filters, RAM & FM board, one desk & one hand mic. Complete with all manuals in original packing. Prefer to sell units together. Asking \$2575 with 20m coax thrown in. Suit new buyer. Matthew Ryan, St Francis' College, Leeton, NSW. 2705. Ph. (069) 53 3622. YAESU FT-707 TCVR: WARC bands. Mint con

YAESU P1-707 TCVR: WARC bands. Mint condition Unmarked in original carton with manuals. Fitted with narrow GW filter. Yaesu YM-55 microphone. Yaesu PC-701 antenna tune, also in mint condition. \$770 the following Kerwood VB-2530, 2m 25W PM ampifiler as new. \$85 VKZTAM, GTHR. Ph; (02) 871 4826 AH or weekends.

FOR SALE - VIC

AUDIBLE SWR METER: cost \$87; never used, \$50. lcom 490A, 70 cm. \$600. Used twice. VK3WX, QTHR. Ph: (03) 25 6340.

COLLECTORS BOOKS: ARRIL Handbooks, 1945, 1947, 1951, 1959 \$10 each. Command sets. 1957 \$5. Fundsmentals of SSB, Collins. 1960 \$5. RCA transmitting tubes. 1938. \$4. Icom IC-25A 2m FM. 25W op 2 VFCs, 5 memories. With inst book & complete workshop manual. In good working order. \$300. VK3OM, CTHR. Ph; (03) 560 \$215.

COMPLETE (ALMOST) SET of R&H RTV&H EA: 1950 to 1980. 3 missing. Some bound. Offers. Geoff VK3ACZ. Ph. (050) 24 5987. COMPUTER: TRS-80 coco 64k extended Basic. Some

cassette software, including Logbook. Original packing. Ex cond. Les VK3PYD, QTHR, Ph. (050) 24 1361. HEATH SB-230 LINEAR AMPLIFIER: 80 to 10m at 1 kW input with Elmac 8873 final. Very little use & in excellent condition, Manual provided, \$650, VK3IH, QTHR. Ph; (03)

HF COMPACT LOOP-TYPE ANTENNA: TET model OPL-4 covering 7, 14, 21, 28 MHz. For anyone living in spartment house, condominium flat or unit. Fits on handrali. 1.7m wide, 1.2m high. Purchased new & only used to test, but unsuitable for my location. Half price \$75. Doug VK3VXY. Ph: (059) 75 5024.

GENERAL ELECTRIC: AM/SSB 40 channel C8. Current model in very good condition. \$200. Oskerblock SWR-200 SWR/PWR meter. 4 months old in excellent condition. \$100. Warner Wulf 11 metre vertical, Good condition. \$40. 13 metres of RG 8U coaxial cable & plugs. \$20. Will swap the above for shortwave rx of similar price & condition. John L30479. Ph: (058) 21 0846 AH.

PLESSEY CARTRIDGE MACHINES: 2 only model no PLESSEY CARTRIDGE MACHINES: 2 only model no CPM-2. Needs some attention. Hills dual polarisation antenna, model FCIC, Tuned to 91.5 MHz. Otari reel-to-reel tape recorder (working). Needs new power lead. All equipment is ex-radio station equipment. No reasonable offer refused. David VK3KGF. Phr. 743 6866 BH or 743 6992 AH. YAESU EQUIPMENT: FT101ZD tovr. \$850. Desk mic,

YD844A. \$55. Both items & manual for tovr in perfect condition. L31285, QTHR. Ph: (03) 29 4314.

FOR SALE - QLD

COLLINS 75S1 rx: fitted with additional 800 Hz CW filter. Collins 32S1 tx, 516H-2 pvrr supply. All units in very clean condition & good working order. Instruction manuals included. Will ship at buyers expense. Total price. \$650. VK4VK, CTHR. Phr. (075) 38 7152 flate 6 pm.

KENWOOD TS-820S TCVR: S/no 740948. Fitted "Ham Radio" mods for 10 & 18 MHz & CW netting. With VFO 820 S/no 750499. Service & operating manuals, mod details, 3 spare valves, mic & leads. \$500. Dennis VKADV. Tin Can Bay, Ph. (071) 84 449.

YAESU EQUIPMENT: FT200 HF tovr with match power supply, 80- 10m SSB & CW including mic & handbook. Mint cond \$250. FRG7700 rx. 0-30 MHz compete with handbook. As new. \$425. Ron VK4EV, QTHR. Ph: (07) 355

FOR SALE — SA

COLLINS 75A4 RX: with spare tubes. \$125. VK5BS. Ph:

KENWOOD TS-120V HF SSB TRANSCEIVER: Unused. \$400. Ph: (06) 383 0071. RADIO TUBES: 4-65A: QE3-300: 829B & socket; 815 HADIO 1 UBES: 4-65A; UE3-300; 8296 & SOCKRI; 015; (4E27/8001) VCR139. Two sets tubes KW 2000. AM tx 160m-50 MHz. Old BC radios (working). 150 various tubes. VK5LC. Ph: (08) 271 6841.

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Page 64 - AMATEUR RADIO, October 1986

October Australian Electronics Monthly with amental gine is to Electronics incorporated! HERE'S A PREVIOUS



We believe one of the fundamental roles of an electronics magazine is to provide brain fodder for enthusiasts and engineers, hobbyists and hardware hackers, amateurs and audiophiles.

OCTOBER'S ELEKTOR SECTION

INDUCTORS IN PRACTICE

In Issue of men apparent simpliciny, material none the less often pose problems because numerite and users processing versione invalidably they cannot be obtained leady-made intumbly may colinor be distanced reductional in they have to be designed and wound by the ie, may nove to be beinghed and wound by the constructor. This article aims at removing some of the obscurites surrounding this subject and me veneumen surrounding ins surjuct and showing that making an inductor is not such a dounting task as some think

LOUDSPEAKER

IMPEDANCE

Will com nents be checked for local availability?

Yes. Prior to publication we will seek out sources of component supply where necessary and/or suggest

Our reader survey showed that you purchase a wide range of

Practical projects and articles that stimulate the mental 'taste buds' and satisfy the cranial cravings, are ever in

demand.

magazines each month, seeking ever more brain fodder. By far the most popular and widely respected of the international journals was Elektor Electronics

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Will project pc boards be available?

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